KCERA
KERN COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

August 2, 2023

Members, Board of Retirement
Employee Bargaining Units
Requesting News Media
Other Interested Parties

Subject: Meeting of the Kern County Employees' Retirement Association Investment Committee

Ladies and Gentlemen:

A meeting of the Kern County Employees' Retirement Association Investment Committee will be held on Tuesday, August 8, 2023 at 8:30 a.m. in the KCERA Boardroom, 11125 River Run Boulevard, Bakersfield, California, 93311.

How to Participate: Listen to or View the Board Meeting
To listen to the live audio of the Board meeting, please dial one of the following numbers (for best audio a landline is recommended) and enter ID# 853 4141 9019

- (669) 900-9128; U.S. Toll-free: (888) 788-0099 or (877) 853-5247

To access live audio and video of the Board meeting, please use the following:

- https://us02web.zoom.us/j/85341419019?pwd=UXhRaFFhN3lHdmdDZ29KTVJ4QTR3QT09
- Passcode: 338061

Items of business will be limited to the matters shown on the attached agenda. If you have any questions or require additional service, please contact KCERA at (661) 381-7700 or send an email to administration@kcera.org.

Sincerely,

Dominic D. Brown
Chief Executive Officer

Attachments

AGENDA:

All agenda item supporting documentation is available for public review on KCERA's website at www.kcera.org following the posting of the agenda. Any supporting documentation that relates to an agenda item for an open session of any regular meeting that is distributed after the agenda is posted and prior to the meeting will also be available for review at the same location.

AMERICANS WITH DISABILITIES ACT
(Government Code §54953.2)

Disabled individuals who need special assistance to listen to and/or participate in the meeting of the Board of Retirement may request assistance by calling (661) 381-7700 or sending an email to administration@kcera.org. Every effort will be made to reasonably accommodate individuals with disabilities by making meeting materials and access available in alternative formats. Requests for assistance should be made at least two (2) days in advance of a meeting whenever possible.

CALL TO ORDER

ROLL CALL (IN PERSON)

AB 2449 REMOTE APPEARANCE(S)

Items 1 and/or 2 withdrawn from agenda if no trustees will have a need to appear via teleconference:

The first two items on the agenda are reserved for trustees who have a need to appear via teleconference due to a "just cause" need or an "emergency circumstance." Trustees who have notified this Committee before agenda-posting will be called upon and will provide a general description of their need to attend via teleconference as allowed by law. Trustees who were not able to notify the Committee in advance of posting and have a need to attend via teleconference will state their notification or request when called upon to do so. All trustees appearing via teleconference will need to disclose any adult person(s) present in the room of their remote location and their relationship to such person(s). Trustees appearing remotely are reminded to keep their camera on throughout the meeting.

1. JUST CAUSE CIRCUMSTANCE(S):

   a) The following Trustee(s) have notified the Committee of a "Just Cause" to attend this meeting via teleconference. (See Government Code § 54953).

      - NONE

   b) Call for Trustee(s) who wish to notify the Committee of a "Just Cause" to attend this meeting via teleconference. (See Government Code § 54953).

2. EMERGENCY CIRCUMSTANCE(S):

a) The following Trustee(s) have requested the Committee approve their attendance of this meeting via teleconference due to an "Emergency Circumstance." (See Government Code § 54953).

- NONE

b) Call for Trustee(s) requesting the Committee approve their attendance of this meeting via teleconference due to an "Emergency Circumstance." (See Government Code § 54953).

TAKE ACTION ON REQUEST(S) FOR REMOTE APPEARANCE

3. Presentation and review of Fixed Income presented by Senior Investment Officer Geoff Nolan – RECEIVE AND FILE

4. Discussion and appropriate action on review of Asset Liability Study presented by Scott Whalen, CFA, Verus, and Chief Investment Officer Daryn Miller, CFA – APPROVE CHANGES TO ASSET ALLOCATION AND LEVEL OF RISK

5. Discussion and appropriate action on private market fund recommendation presented by Mark Mallory, Investment Director, Cambridge Associates[1], and Senior Investment Officer Geoff Nolan – APPROVE UP TO $30MM COMMITMENT TO SILVER POINT SPECIALTY CREDIT FUND III; AUTHORIZE CHIEF EXECUTIVE OFFICER TO SIGN, SUBJECT TO LEGAL ADVICE AND REVIEW

6. Discussion and appropriate action on private market fund recommendation presented by Keirsten Lawton, Managing Director, Cambridge Associates[2], and Senior Investment Officer Geoff Nolan – APPROVE UP TO $30MM COMMITMENT TO ARES PATHFINDER FUND II; AUTHORIZE CHIEF EXECUTIVE OFFICER TO SIGN, SUBJECT TO LEGAL ADVICE AND REVIEW

7. Discussion and appropriate action on opportunistic fund recommendation presented by Spencer Edge, Albourne America[3], and Chief Investment Officer Daryn Miller, CFA – APPROVE UP TO $30MM INVESTMENT IN HUDSON BAY SPECIAL OPPORTUNITIES FUND; AUTHORIZE CHIEF EXECUTIVE OFFICER TO SIGN, SUBJECT TO LEGAL ADVICE AND REVIEW

1 Written materials and investment recommendations from the consultants, fund managers and KCERA investment staff relating to alternative investments are exempt from public disclosure pursuant to California Government Code § 7928.710, § 7922.000, and §54957.5.

2 Written materials and investment recommendations from the consultants, fund managers and KCERA investment staff relating to alternative investments are exempt from public disclosure pursuant to California Government Code § 7928.710, § 7922.000, and §54957.5.

3 Written materials and investment recommendations from the consultants, fund managers and KCERA investment staff relating to alternative investments are exempt from public disclosure pursuant to California Government Code § 7928.710, § 7922.000, and §54957.5.

PUBLIC COMMENTS

8. The public is provided the opportunity to comment on agenda items at the time those agenda items are discussed by the Committee. This portion of the meeting is reserved for persons to address the Committee on any matter not on this agenda but under the jurisdiction of the Committee. Committee members may respond briefly to statements made or questions posed. They may ask a question for clarification and, through the Chair, make a referral to staff for factual information or request staff to report back to the Committee at a later meeting. Speakers are limited to two minutes. Please state your name for the record prior to making a presentation.

REFERRALS TO STAFF, ANNOUNCEMENTS OR REPORTS

9. On their own initiative, Committee members may make a brief announcement, refer matters to staff, subject to KCERA's rules and procedures, or make a brief report on their own activities.

10. Adjournment

Fixed Income Portfolio 2023 Strategic Review

August 2023

Agenda

Background/ Objectives

Putting Fixed Income in Context

- Kern County Employees' Retirement Association (KCERA) Board of Retirement
  - The KCERA Board ("Board") sets policy and is ultimately responsible for the investment program.
  - The Board oversees the investment management activities of KCERA, has the authority to set and monitor portfolio risk and set asset allocation.

- Role of Fixed Income in the KCERA Portfolio
  - The objectives of fixed income investments, pursuant to policy, are:
    - Primary Objective: provide risk mitigation (to equity risk) & liquidity;
    - Secondary Objective: income generation and diversification.

- Fixed Income Strategic Review Objective
  - Primary Objective: determine whether the fixed income asset allocation can be enhanced to improve upon the current risk mitigation (to equity risk) & liquidity benefits.
  - Secondary Objective: minimize income loss and improve diversification.

- KCERA staff worked with Verus & PIMCO on the Strategic Review
  - KCERA staff provided inputs, feedback & guidance on preferred portfolios.
  - Verus & PIMCO ran the asset allocation analytics given KCERA staff guidance.

Fixed Income's Role: Providing Risk Mitigation & Liquidity for KCERA Portfolio

Agenda

Executive Summary

- De-Risk Fixed Income Portfolio to Enhance Risk Mitigation & Liquidity
  - Risk mitigation & liquidity benefits can be enhanced by de-risking. De-risking entails:
    - Lowering non-investment grade/investment grade credit & emerging markets debt (EMD) exposure;
    - Moving to Core from Core+ credit mandates & EMD to hard dollar only;
    - Increasing US Treasury exposure;
    - Increasing securitized products exposure; and,
    - Adding a short-term credit sleeve.

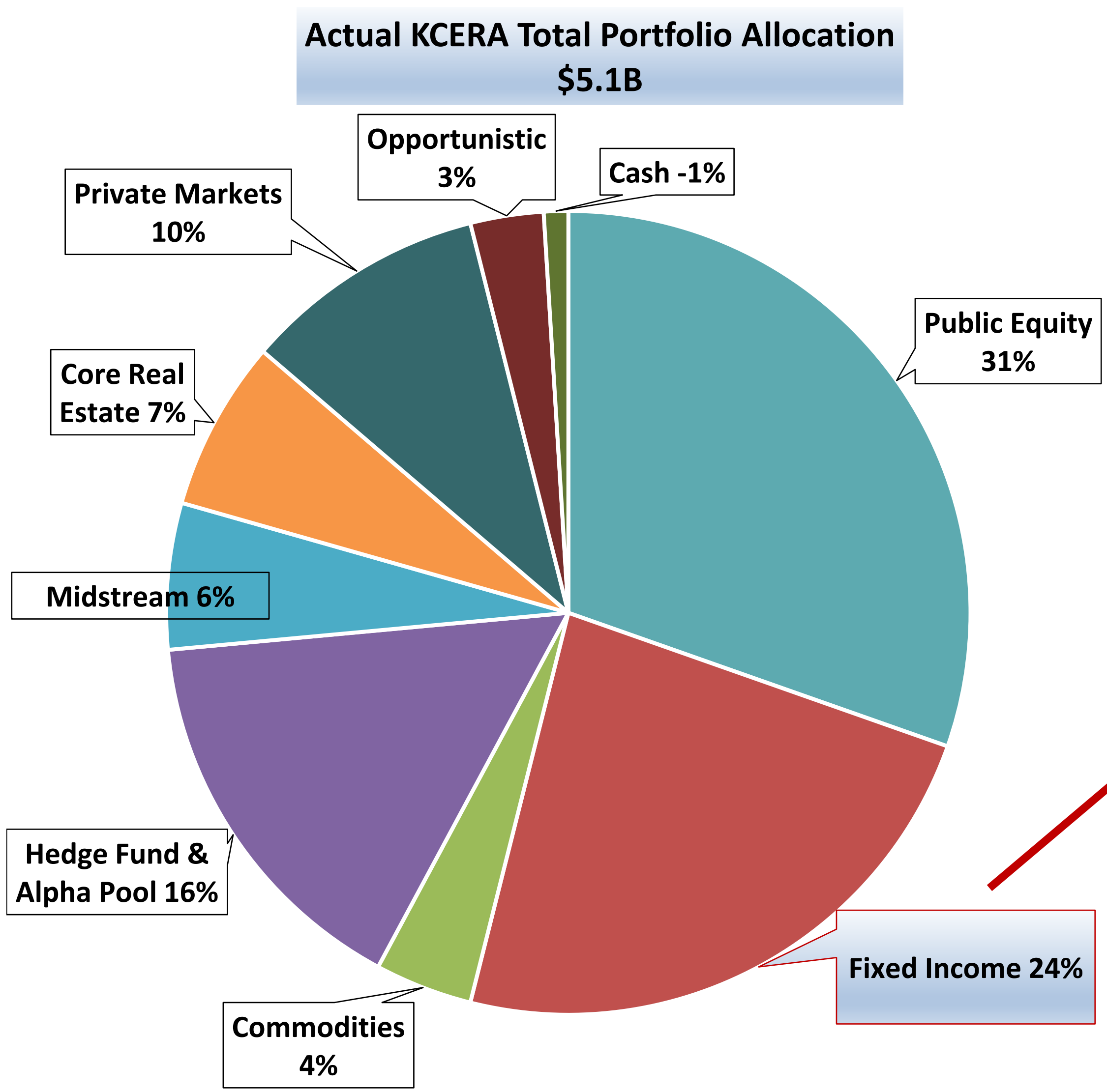
- Benefits of De-Risking (*Proposed Portfolio Compared to Policy*)
  - Reduced volatility;
  - Reduced drawdown potential; and,
  - Improved equity diversification.

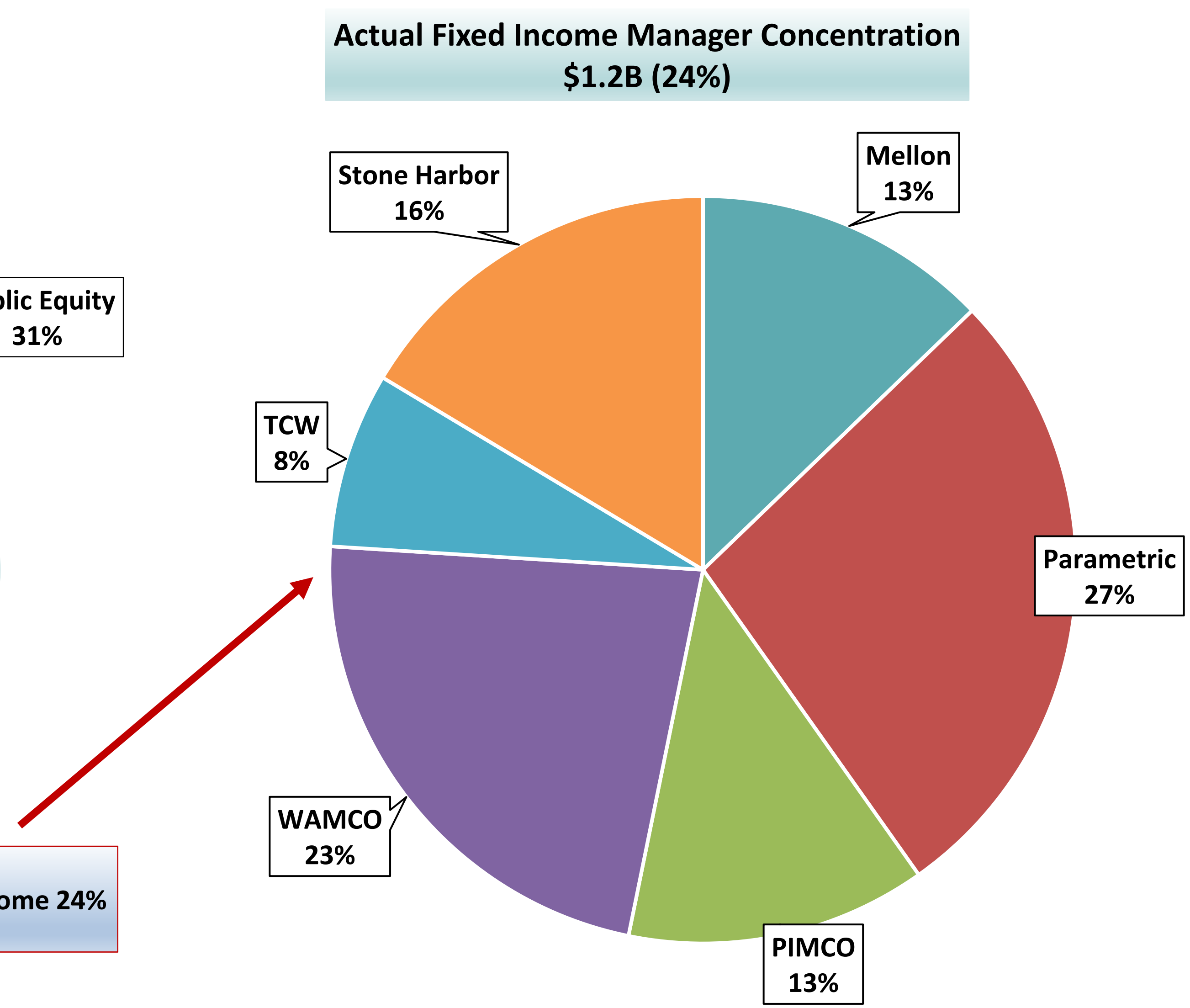
- Further De-Risking Comes with Trade-Offs
  - While de-risking improves fixed income's role within the KCERA portfolio, it comes with a trade-off:
    - Lower expected long-term returns.
      - Up in quality, shifting away from higher yielding assets.

Further De-Risk Fixed Income Portfolio To Improve Risk Mitigation & Liquidity

Strategic Review: KCERA Fixed Income Program Overview

Putting Fixed Income in Context - Current Portfolio Composition

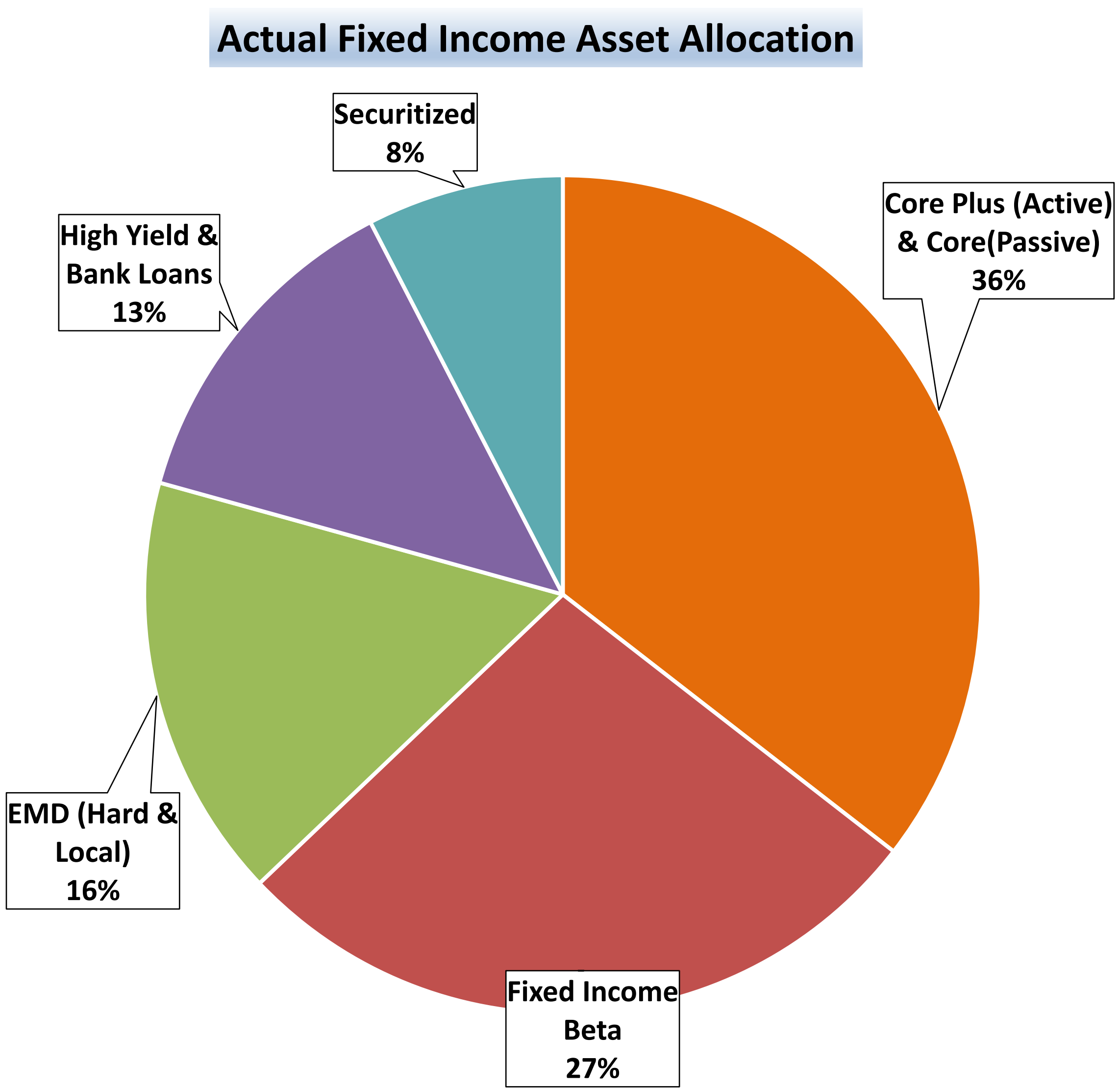


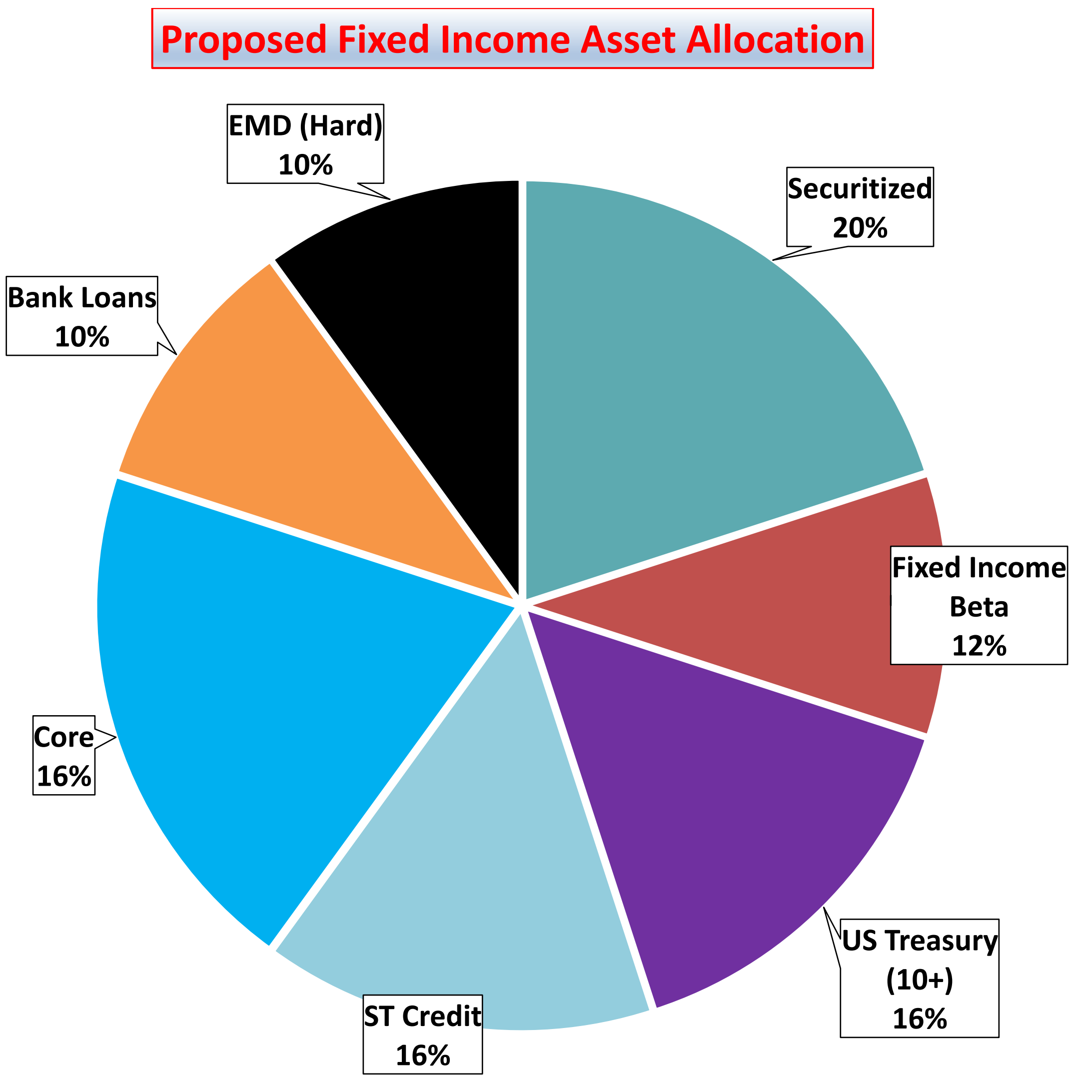


Fixed Income Represents a Significant Portion of KCERA Assets

As of 12/31/22

Strategic Review: KCERA Fixed Income Program Overview





Asset Allocation Changes to De-Risk Fixed Income Portfolio

As of 12/31/22

Agenda

Strategic Review: Model Input Overview

- Optimization Objectives
  - Diversify equity risk & overall KCERA portfolio;
  - Provide liquidity in down markets; and,
  - Earn adequate return for a given level of risk.

- Key Constraints
  - Equity beta ≤ 0.06
  - Estimated volatility ≤ 4.5%
  - Sub-strategy allocation limits (see table on right ➔)

- Return Horizon
  - 10 years

- Return / Volatility / Duration / Correlation Assumptions
  - Verus & PIMCO Capital Markets Assumptions
    - Please see appendix for details.

- Metric To Measure
  - Equity beta
  - Sharpe ratio

	Allocation Limits	
Categories	Min	Max
Liquidity	0%	5%
Securitized	3%	20%
Treasuries	16%	32%
TIPS	0%	5%
IG Credit	5%	15%
Core	16%	40%
Non-IG	3%	18%
Global	0%	20%
EMD	3%	21%

Agenda

1. Background/Objectives
2. Executive Summary
3. Strategic Review: Model Input Overview
4. Strategic Review: Model Portfolios & Key Metrics
5. Strategic Review: Benchmarks
6. Strategic Review: Implementation Guidelines
7. Summary
8. Appendix

Strategic Review: Asset Allocation Portfolios

Fixed Income AUM $1,232 MM as of 12/22	KCERA Actual (A)		Policy (B)	Proposed (C)	Change: Actual to Proposed (C-A)	Change: Policy to Proposed (C-B)
Securitized	8%	$ 94	0%	20%	12%	20%
Fixed Income Beta	27%	$ 337	0%	12%	-15%	12%
US Treasuries (1-10)	0%	$ -	0%	0%	0%	0%
US Treasuries (10+)	0%	$ -	0%	16%	16%	16%
Subtotal	27%	$ 337	0%	28%	1%	28%
ST Credit	0%	$ -	0%	16%	16%	16%
ST Gov't / Credit	0%	$ -	0%	0%	0%	0%
IG Corporate Credit (10+)	0%	$ -	0%	0%	0%	0%
Subtotal IG Credit	0%	$ -	0%	16%	16%	16%
Core Plus Fixed Income (IG + HY)	23%	$ 279	33%	0%	-23%	-33%
Core Fixed Income	13%	$ 158	25%	16%	3%	-9%
Subtotal Core	35%	$ 437	58%	16%	-19%	-42%
High Yield & Bank Loans	13%	$ 162	25%	0%	-13%	-25%
High Yield	0%		0%	0%	0%	0%
Bank Loans	0%		0%	10%	10%	10%
Subtotal Non-Investment Grade	13%	$ 162	25%	10%	-3%	-15%
EMD (Hard & Local)	16%	$ 202	17%	0%	-16%	-17%
EMD (Hard Dollar)	0%	$ -	0%	10%	10%	10%
Subtotal EMD	16%	$ 202	17%	10%	-6%	-7%
Total	100%	$ 1,232	100%	100%	0%	0%

Increase Securitized Product Exposure

Reallocate US Treasury Exposure by adding Long Treasury Sleeve

Add Short Term Investment Grade Credit Sleeve

Reduce Higher Risk Core+ Exposure; Move to Core

Reduce Non-Investment Grade Exposure; Move to Bank Loans Only

Reduce EMD & Move to Hard Dollar Only

Further De-Risking the Fixed Income Portfolio

Strategic Review: Fixed Income Portfolio Characteristics

Portfolio Characteristic Estimates	Actual (A)	Policy (B)	Proposed (C)	Change: Actual to Proposed (C-A)	Change: Policy to Proposed (C-B)
10-year Return	5.30	5.65	5.21	(0.09)	(0.44)
Volatility	4.59	4.59	4.30	(0.29)	(0.29)
CVaR (95%)	5.55	5.63	4.41	(1.14)	(1.22)
Sharpe Ratio	0.31	0.36	0.34	0.03	(0.02)
Equity Beta vs S&P 500	0.10	0.16	0.06	(0.04)	(0.10)
Duration	5.58	4.95	5.88	0.30	0.93

Lower Returns are the “cost” of de-risking

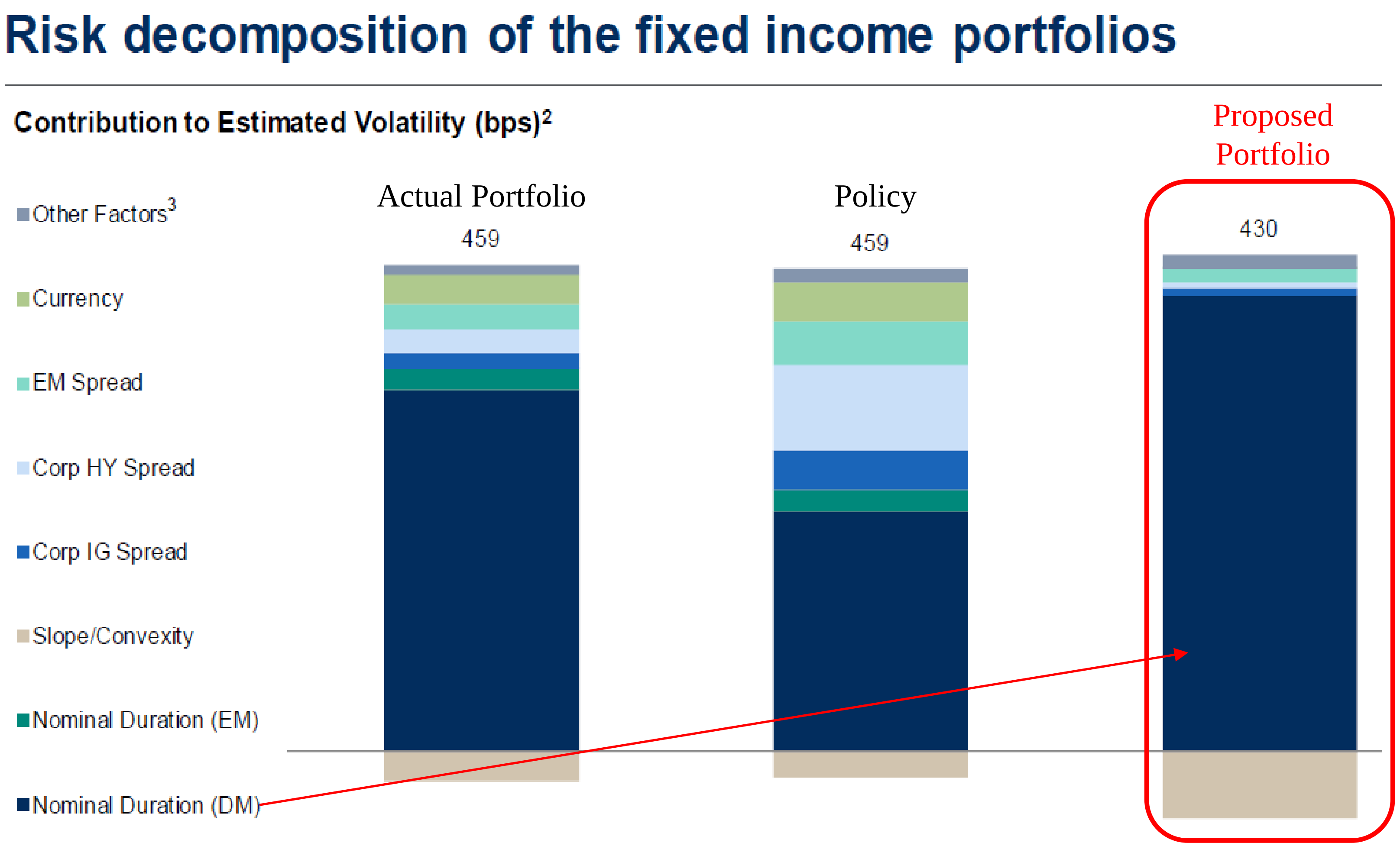
Reduced Volatility & Drawdown Potential

Improved Equity Diversification

Source: Verus & PIMCO

Further De-Risking Enhances Diversification & Liquidity

Strategic Review: Additional Risk Metrics



Developed Markets Duration is Primary Factor Risk

Source: PIMCO

Agenda

Strategic Review: Benchmarks

- KCERA staff proposes updating the benchmarks to align them with the proposed fixed income asset allocation.
- Proposed Fixed Income Benchmarks

Mandate	Benchmark
Investment Grade	
Core Fixed Income	Bloomberg US Agg Total Return Value Unhedged USD
Short Term Credit	Bloomberg US Corporate Credit 1-3 Year Index
Non-Investment Grade Credit	
Bank Loans	S&P LSTA Leverage Loan Index
Treasuries	57% ICE BofAML US Treasury 10+; 43% ICE BofAML 7-10 Year US Treasury Index
Fixed Income Beta	
US Treasuries (10+)	
Securitized Products	50% Bloomberg Non-Agency CMBS Index, 33.33% Bloomberg ABS Index, 16.67% JPM CLOIE AA Index
Emerging Markets Debt	JPM EMBI Global Diversified

Realigning Fixed Income Benchmarks to Better Align with Proposed Asset Class Strategies

Agenda

1. Background/Objectives
2. Executive Summary
3. Strategic Review: Model Input Overview
4. Strategic Review: Model Portfolios & Key Metrics
5. Strategic Review: Benchmarks
6. Strategic Review: Implementation Guidelines
7. Summary
8. Appendix

Strategic Review: Implementation Guidelines

- Given the complexity and amount of fund movements involved in the proposed portfolio realignment, implementation of the changes from the Strategic Review would take place at a measured pace.

- Manager Searches
  - Initiate searches for new mandates: Core, Credit, US Treasury, EMD (Hard Currency), Securitized Products and Bank Loan.
  - At a measured pace, recommendations will be brought to the Investment Committee and Board of Retirement for review & approval.

- Funding New Mandates
  - Work with transition manager to determine an efficient & cost-effective funding plan.
  - Depending on timing of onboarding of new managers, funding of mandates may be run in parallel.

- Other
  - To minimize the costs of the realignment, in-kind transfers and arms-length crossing trades within managers may be considered.

Portfolio Realignment to Occur at a Measured Pace

Agenda

Summary

- Portfolio Asset Allocation
  - Proposed portfolio proposed on p. 11

- Fixed Income Benchmarks
  - Benchmarks as proposed on p. 15

Proposed Portfolio and Updated Fixed Income Benchmarks
are included in Total Plan Asset Liability Study

Agenda

Appendix: Verus Capital Markets Assumptions

Asset Class	Index Proxy	Ten-Year Return Forecast		Standard Deviation Forecast	Sharpe Ratio Forecast (g)	Sharpe Ratio Forecast (a)	10-Year Historical Sharpe Ratio (g)	10-Year Historical Sharpe Ratio (a)
		Geometric	Arithmetic					
Fixed Income								
Cash	30 Day T-Bills	3.30%	3.30%	1.20%	-	-	-	-
U.S. TIPS	Bloomberg U.S. TIPS 5-10	4.10%	4.30%	5.60%	0.14	0.18	0.06	0.08
U.S. Treasury	Bloomberg Treasury 7-10 Year	3.80%	4.00%	7.10%	0.07	0.1	-0.02	0.01
Long U.S. Treasury	Bloomberg Treasury 20+ Year	3.80%	4.60%	13.20%	0.04	0.10	(0.01)	0.05
Global Sovereign ex U.S.	Bloomberg Global Treasury ex U.S.	2.20%	2.70%	10.00%	-0.11	-0.06	-0.47	-0.44
Global Aggregate	Bloomberg Global Aggregate	3.00%	3.20%	6.70%	-0.05	-0.01	-0.3	-0.28
Core Fixed Income	Bloomberg U.S. Aggregate Bond	4.30%	4.40%	4.60%	0.22	0.24	0.05	0.07
Core Plus Fixed Income	Bloomberg U.S. Universal	4.60%	4.70%	4.60%	0.28	0.3	0.17	0.14
Short-Term Gov't/Credit	Bloomberg U.S. Gov't/Credit 1-3 Year	3.90%	4.00%	3.70%	0.16	0.19	0.11	0.11
Short-Term Credit	Bloomberg Credit 1-3 Year	4.30%	4.40%	3.70%	0.27	0.3	0.4	0.4
Long-Term Credit	Bloomberg Long U.S. Credit	5.30%	5.90%	11.00%	0.18	0.24	0.11	0.16
High Yield Corp. Credit	Bloomberg U.S. Corporate High Yield	6.40%	7.00%	11.20%	0.28	0.33	0.44	0.47
Bank Loans	S&P/LSTA Leveraged Loan	6.80%	7.20%	9.20%	0.38	0.42	0.53	0.54
Global Credit	Bloomberg Global Credit	4.50%	4.80%	7.90%	0.15	0.19	0	0.03
Emerging Markets Debt (Hard)	JPM EMBI Global Diversified	8.90%	9.40%	10.70%	0.52	0.57	0.05	0.09
Emerging Markets Debt (Local)	JPM GBI-EM Global Diversified	7.00%	7.70%	12.30%	0.3	0.36	-0.28	-0.23
Private Credit	S&P LSTA Leveraged Loan Index	8.20%	9.00%	13.00%	0.38	0.44	-	-
Private Credit (Direct Lending - Unlevered)	S&P LSTA Leveraged Loan Index	6.80%	7.20%	9.20%	0.38	0.42	-	-
Private Credit (Direct Lending - Levered)	S&P LSTA Leveraged Loan Index	9.10%	10.10%	15.30%	0.38	0.44	-	-
Private Credit (Credit Opportunities)	S&P LSTA Leveraged Loan Index	8.50%	9.40%	13.80%	0.38	0.44	-	-
Private Credit (Junior Capital / Mezzanine)	S&P LSTA Leveraged Loan Index	9.00%	10.00%	15.10%	0.38	0.44	-	-
Private Credit (Distressed)	S&P LSTA Leveraged Loan Index	9.10%	12.70%	29.10%	0.2	0.32	-	-

As of 11/2022. Source: Verus.

Appendix: PIMCO Capital Markets Assumptions

Sector	Proxy	Estimated Return[1]	Estimated Volatility[2]	Equity Beta vs. S&P500	Duration	Actual Fixed Income	Policy Fixed Income	Proposed
Short Duration (Liquidity)	ICE US 1M T-Bill Index	3.0%	0.1%	0.00	0.08	-	-	-
Securitized	Securitized (Custom Sec. Benchmark)*	5.3%	3.4%	0.09	2.89	7.6%	-	20.0%
Fixed Income Beta	ICE US Treasury 7-10Yr Index	3.9%	6.2%	-0.05	7.42	27.4%	-	12.0%
US Treasuries (1-10)	ICE US Treasury 1-10Yr Index	3.6%	3.1%	-0.01	3.68	-	-	-
US Treasuries (10+)	ICE US Treasury 10+Yr Index	4.4%	11.0%	-0.15	15.37	-	-	16.0%
TIPS	ICE US TIPS 5-10Yr Index	4.1%	6.1%	0.13	6.78	-	-	-
ST Credit	BBG US Corp. 1-3Yr Index	4.2%	1.7%	0.03	1.85	-	-	16.0%
ST Gov't / Credit	BBG US Govt/Credit 1-3Yr Index	3.5%	1.7%	0.01	1.86	-	-	-
IG Corporate Credit (10+)	BBG US Long Credit Index	5.3%	10.5%	0.26	12.21	-	-	-
Core Plus Fixed Income (IG + HY)	BBG US Universal Index	4.4%	4.6%	0.05	5.97	22.7%	33.3%	-
Core Fixed Income (IG, Passive)	BBG US Aggregate Index (Passive)	4.3%	4.8%	0.02	6.22	12.8%	-	-
Core Fixed Income (IG, Active)	BBG US Aggregate Index (Active)	4.3%	4.9%	0.02	6.22	-	25.0%	16.0%
High Yield	BBG US High Yield Index	5.4%	6.8%	0.35	3.38	6.6%	12.5%	-
Bank Loans	S&P LSTA Leveraged Loan Index	5.6%	6.1%	0.32	0.12	6.6%	12.5%	10.0%
Global Sovereign ex US (USD-H)	JPM GBI Global Index (USDH)	3.9%	4.0%	-0.01	7.15	-	-	-
EMD (Hard & Local)	EMD Hard and Local Benchmark	5.9%	8.1%	0.30	5.78	16.4%	16.7%	-
EMD (Hard Dollar)	JPM EMBI Index	5.9%	7.4%	0.29	6.47	-	-	10.0%
	Total					**100.0%**	**100.0%**	**100.0%**

As of June 30, 2023. Source: PIMCO.

Verus

PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

AUGUST 2023

Asset-Liability Study

Kern County Employees' Retirement Association

Table of Contents

Verus

VERUSINVESTMENTS.COM

SEATTLE 206.622.3700
CHICAGO 312.815.5228
PITTSBURGH 412.784.6678
LOS ANGELES 310.297.1777
SAN FRANCISCO 415.362.3484

Introduction

Session objectives

— Evaluate risk and return characteristics of KCERA's current policy portfolio and alternative asset mixes within an asset-liability framework

— Recommend adjustments to the strategic asset allocation as appropriate

Asset-liability process overview

Key Inputs:

- Current financial position
- Expected plan liabilities and cash flows contributions
- Capital market assumptions

Analytical Modelling Tools:

MPI
Risk and Return Analysis

Winklevoss Technologies ProVal
Stochastic Modelling

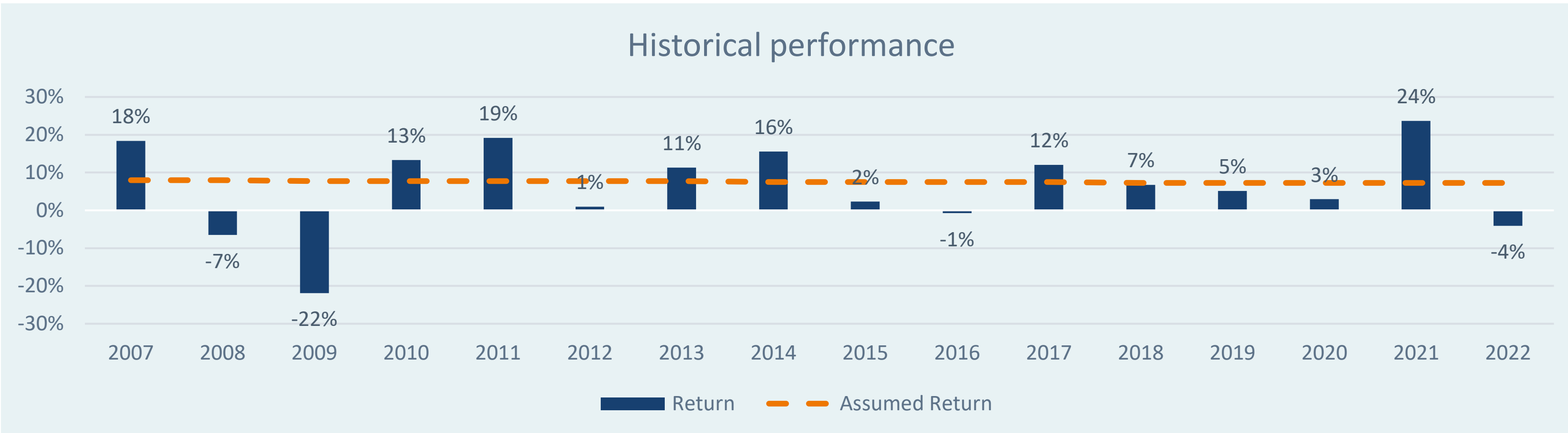
MSCI BarraOne
Stress Testing and Risk Analysis

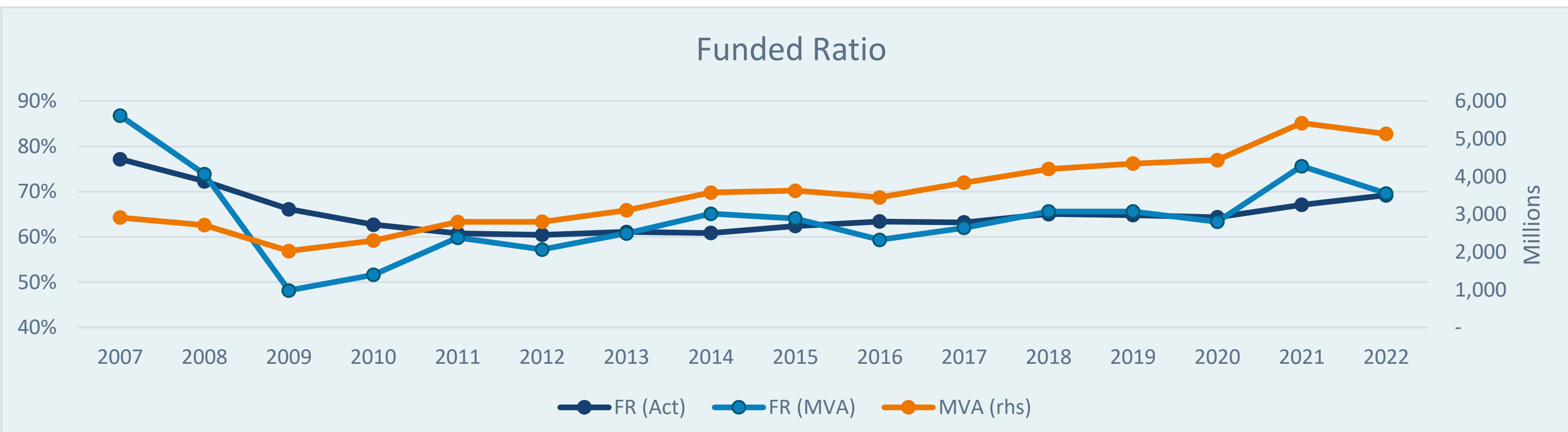
Decision factors:

- Funded status
- Return expectations
- Sensitivity Analysis
- Scenario analysis
- Stress tests
- Liquidity coverage

Setting the stage – historical experience

Returns and funding

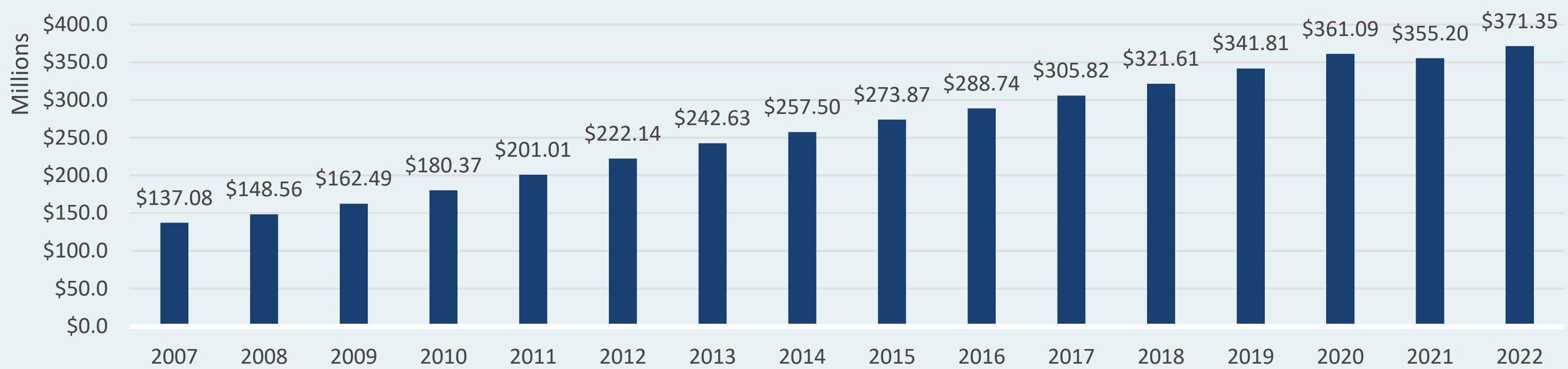




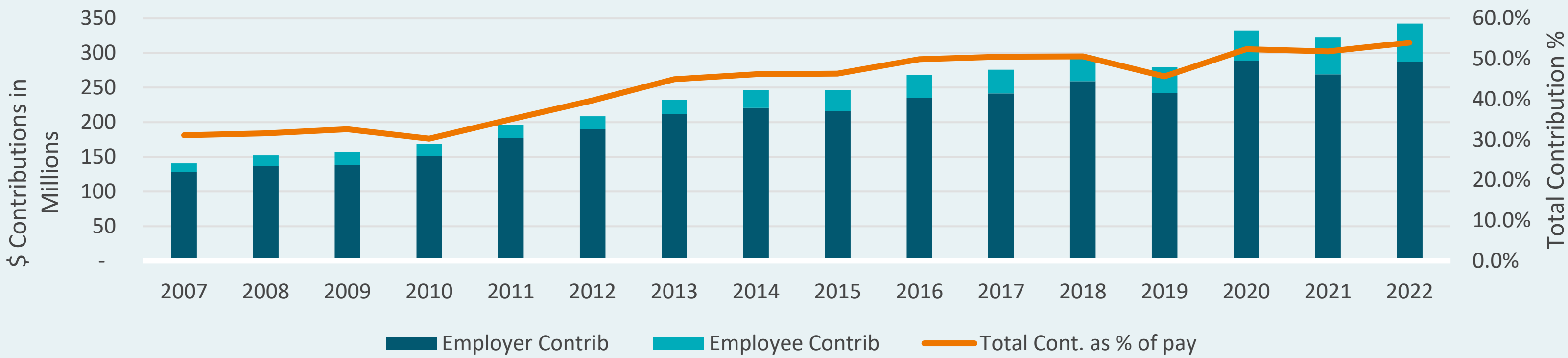
Despite turbulent markets and choppy investment performance, assets have more than doubled since the Global Financial Crisis, and funding status has meaningfully improved.

Benefit payments and contributions

BEFITS PAID (IN MILLIONS)



ANNUAL CONTRIBUTIONS



Aggregate benefits and contributions have increased steadily over time.

Deterministic forecasts
(set-value variables)

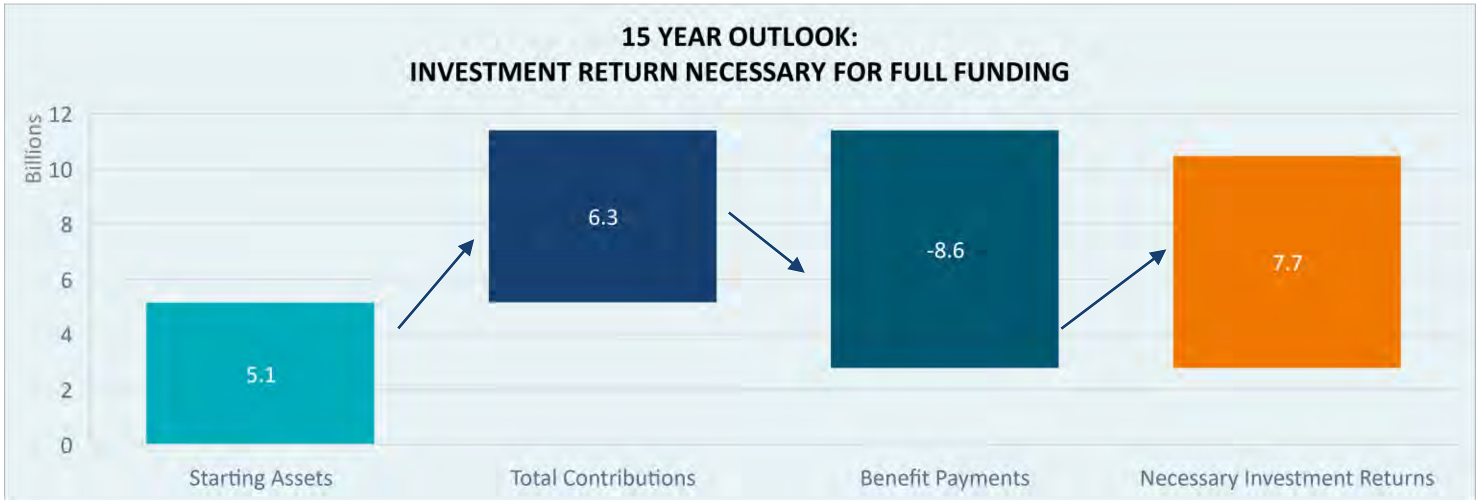
The pension equation

Current Assets + Investment Returns + Future Contributions = Future Benefits & Expenses

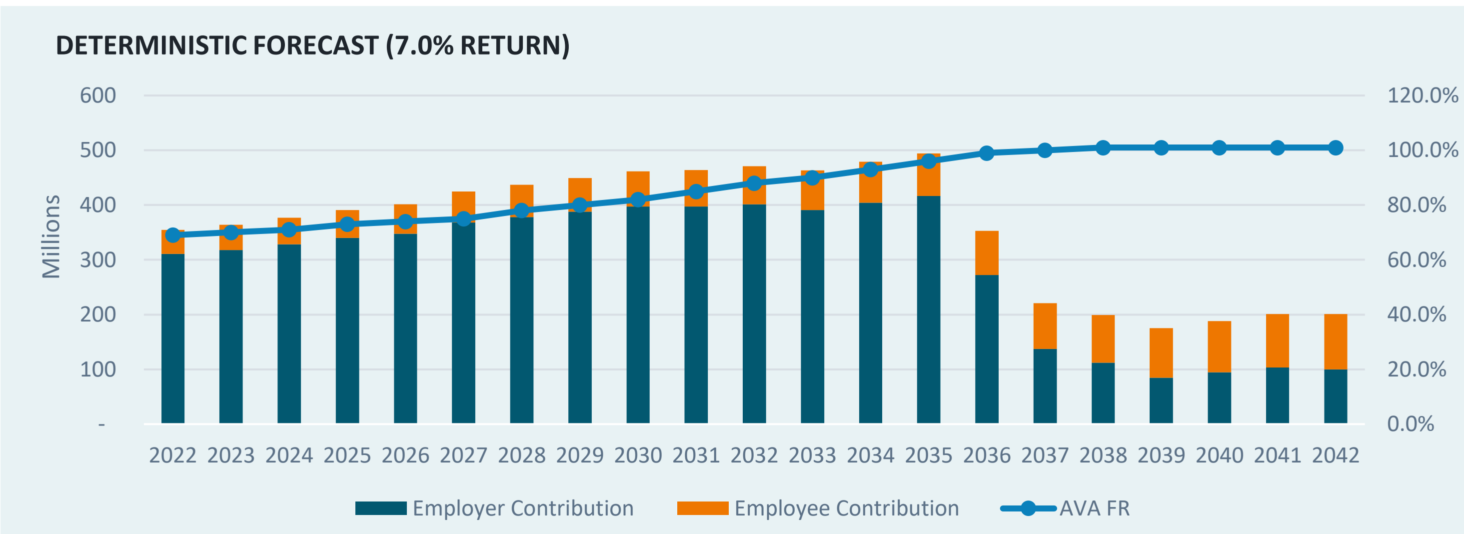
↑

Assumptions

The pension equation in action



Under the current funding policy, the Plan will require total investment returns of approx. $7.7 billion to become fully funded by 2037.

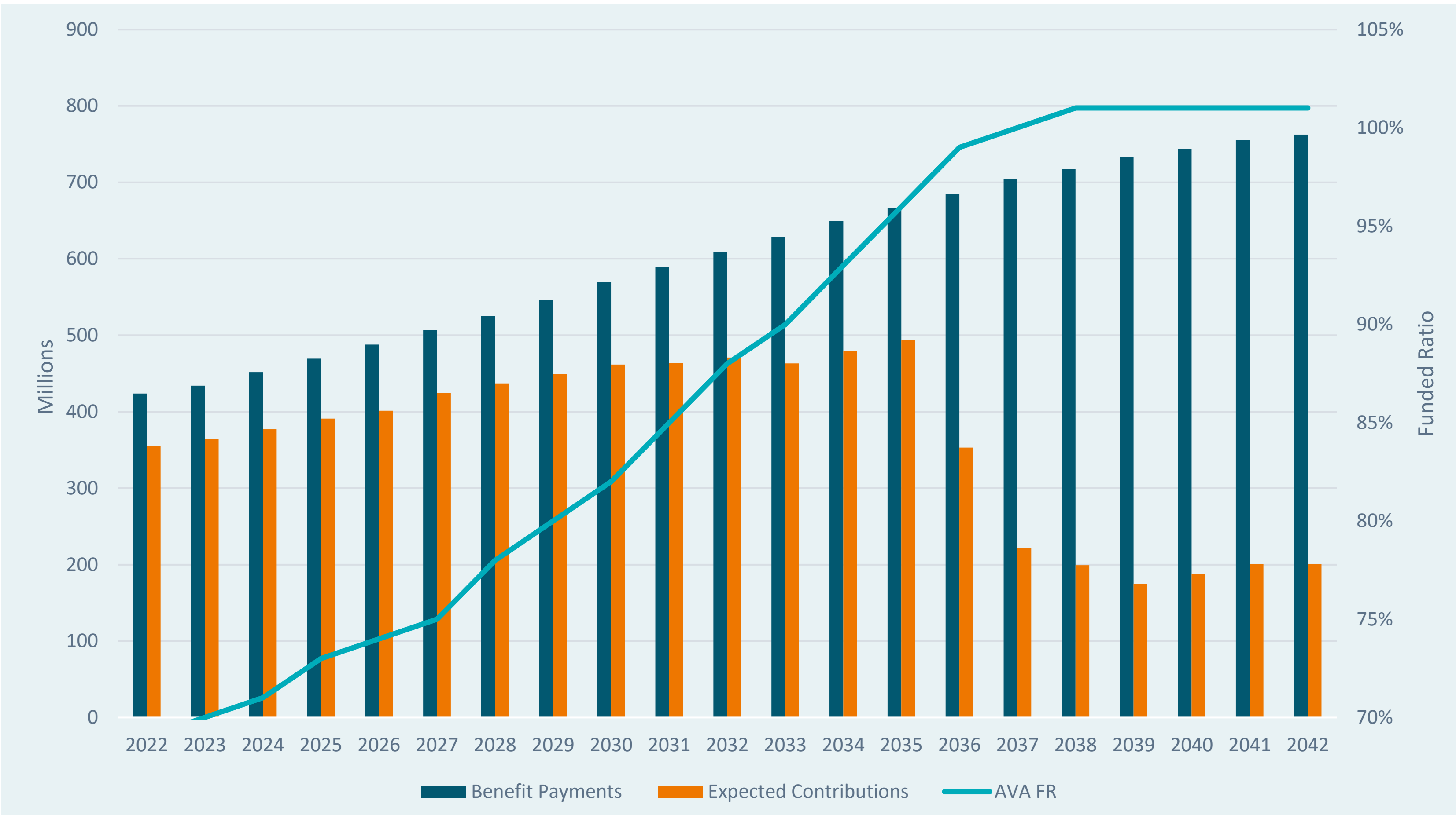


Assuming the current discount rate of 7.0%, contributions will rise steadily until the Plan is fully funded and will then decrease substantially

15-year outlook starts with 2023 expected assets

Funded status projection

Aggregate deterministic projection (7.0% discount rate and return)

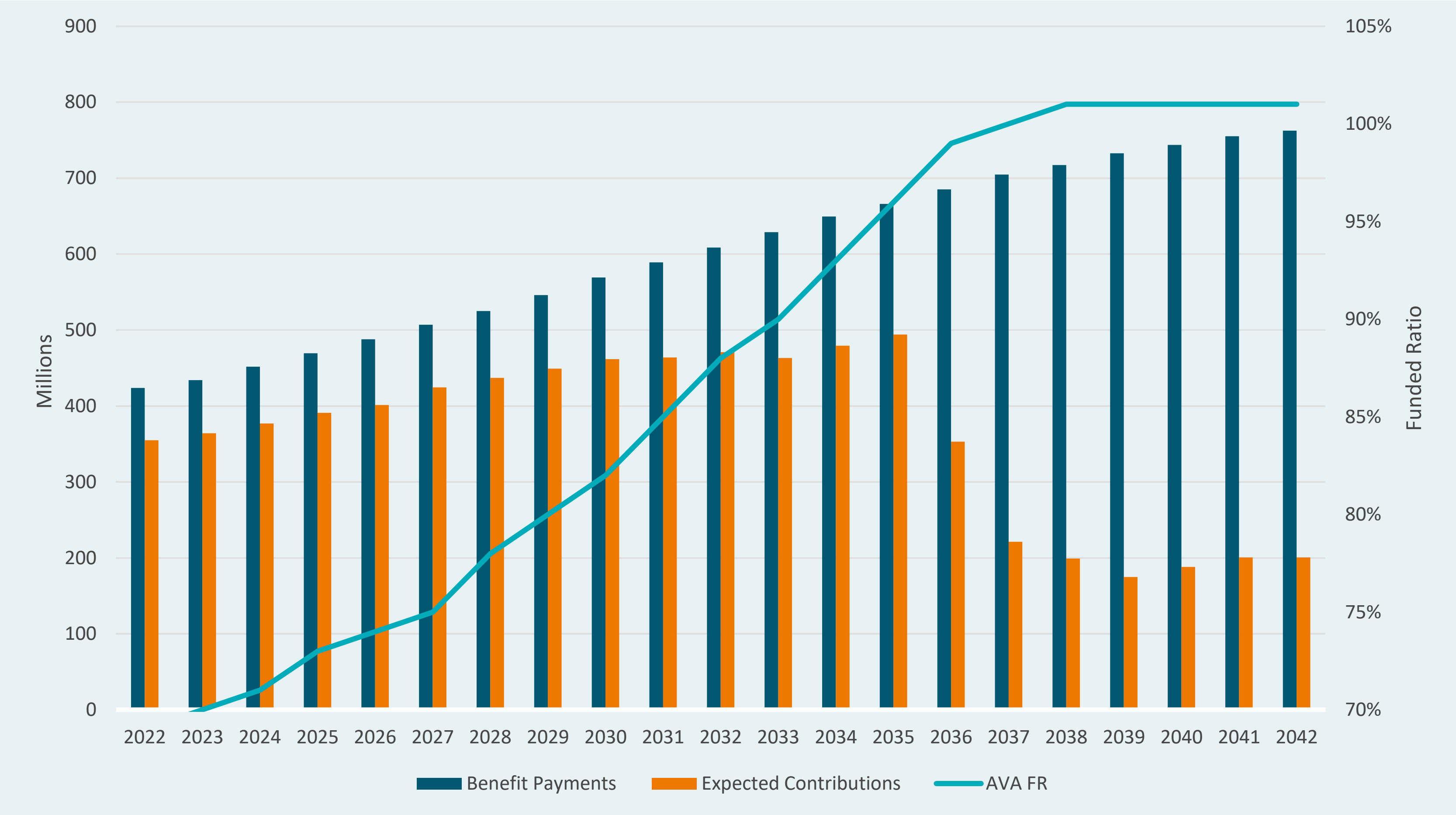


On a deterministic basis the Plan's funded status is expected to reach 100% in 2037

Assumes stated return in each projection year. Assumes discount rate is equal to projected return. AVA FR=funded ratio using actuarial value of assets. Data reflects actuarial values. Assumes current contribution rates in projections (employer contributions are normal cost + contribution to unfunded actuarial accrued liability (UAAL)).

Funded status projection (cont'd)

Aggregate deterministic projection (6.75% return)



The plan can still achieve fully funded status in 2037 by earning a 6.75% return rather than 7.0%, but this would increase contributions by about $290mm over the projected period.

Assumes stated return in each projection year. Assumes discount rate is equal to projected return. AVA FR=funded ratio using actuarial value of assets, Data reflects actuarial values. Assumes current contribution rates in projections (employer contributions are normal cost + contribution to unfunded actuarial accrued liability (UAAL)).

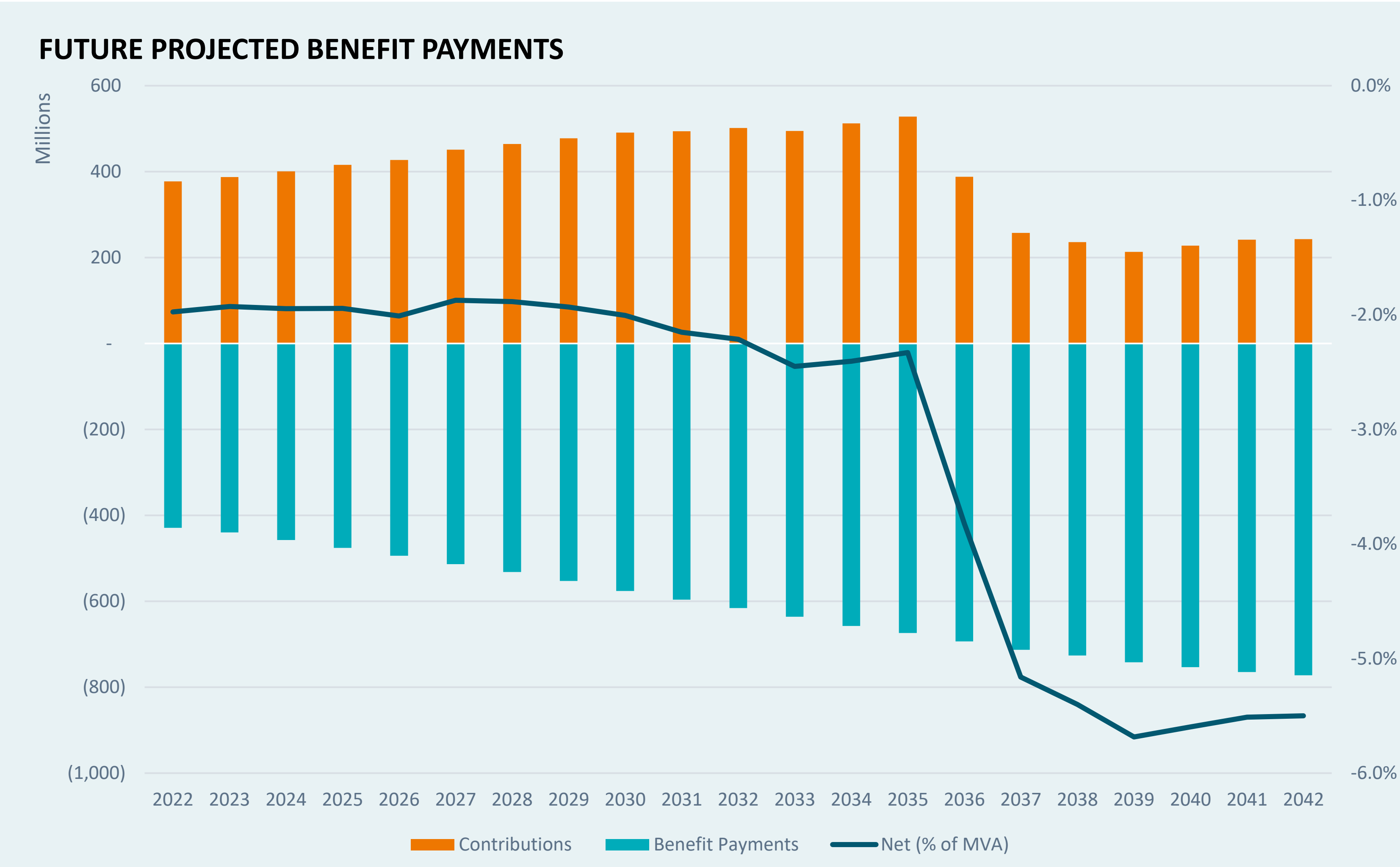
Funded status heat map

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
6.0% return	69%	70%	71%	72%	72%	73%	75%	76%	78%	80%	82%
6.25% return	69%	70%	71%	73%	72%	74%	76%	77%	79%	81%	83%
6.50%return	69%	70%	71%	73%	73%	74%	76%	78%	80%	83%	85%
6.75% return	69%	70%	71%	73%	73%	75%	77%	79%	81%	84%	86%
Baseline (7.0%)	69%	70%	71%	73%	74%	75%	78%	80%	82%	85%	88%
7.25% return	69%	70%	72%	74%	74%	76%	78%	81%	84%	86%	89%
7.50% return	69%	70%	72%	74%	74%	77%	79%	82%	85%	88%	91%
7.75% return	69%	70%	72%	74%	75%	77%	80%	83%	86%	89%	92%
8.0% return	69%	70%	72%	74%	75%	78%	81%	84%	87%	90%	94%

KCERA's funded status is highly sensitive to variation in the investment return.

Funded ratio measured using actuarial market values.

Liability and contribution projections

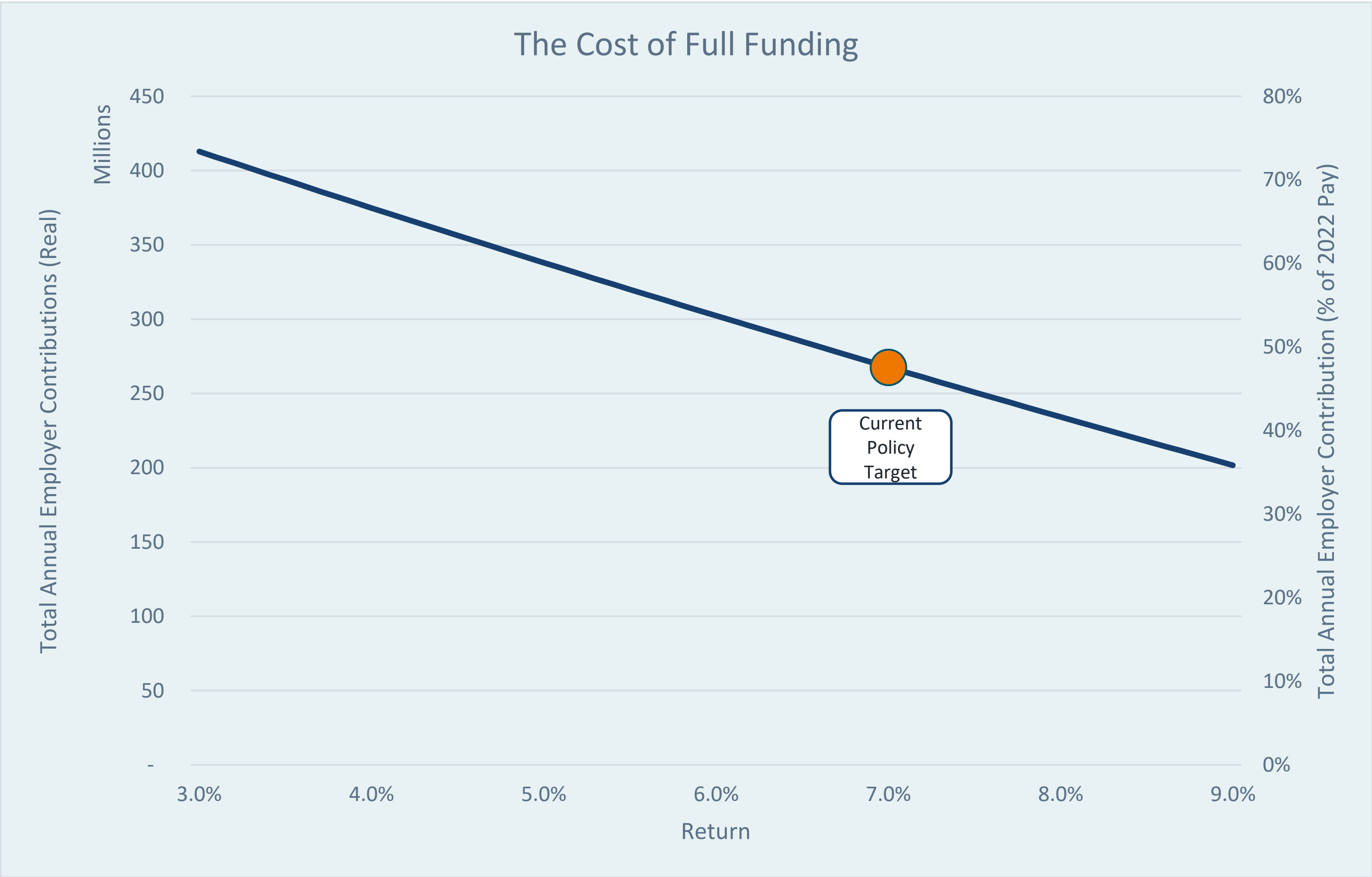


Once the plan reaches fully funded status, employer contributions are expected to decline.

Assumes stated return in each projection year. Assumes discount rate is equal to projected return. AVA FR=funded ratio using actuarial value of assets, Data reflects actuarial values. Assumes current contribution rates in projections (employer contributions are normal cost + contribution to unfunded actuarial accrued liability (UAAL)).

Getting to fully funded: investment returns vs. contributions

THE COST OF FULL FUNDING



There is a relationship between the contributions the plan makes and the return which it must attain to achieve its goals.

The Annual Required Contribution (ARC) contribution plan will (if our projections of the current policy are correct), increase contributions in line with this chart.

Contributions reflected in this graph are displayed as an annual cost in real terms via the inflation assumption.. Assumes all other assumptions (mortality, disability, plan growth, etc.) are met exactly.

Cost of de-risking

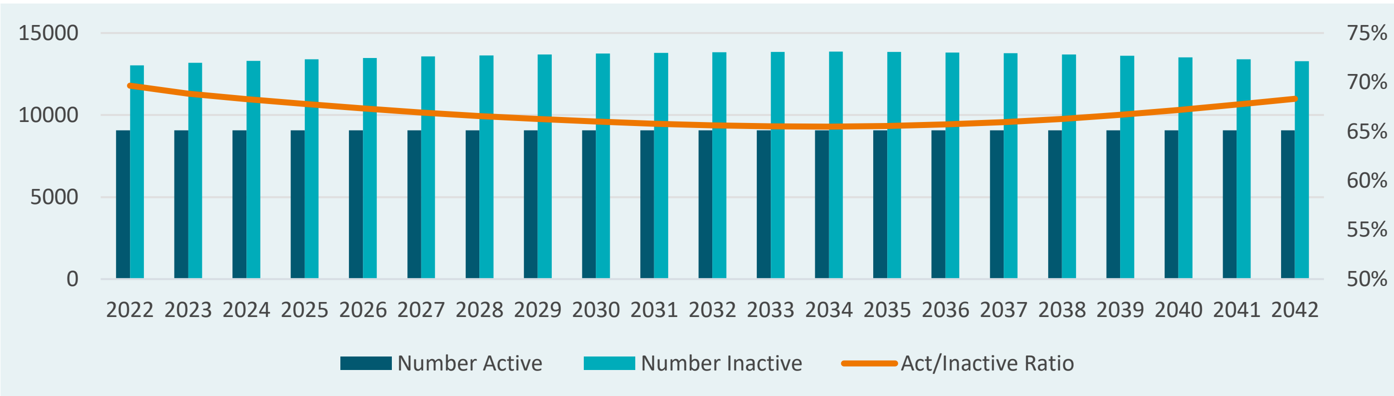
THE COST OF DE-RISKING

Assuming the current funding policy, a 1% change in the discount rate results in a change of roughly $70mm in total real contributions through 2037.

Contributions reflected in this graph are displayed as an annual cost in real terms via the inflation assumption. Data displayed in this chart assumes investment returns equal the discount rate for the entire modeling period and all other assumptions (mortality, disability, plan growth, etc.) are met exactly.

Impact of plan demographics

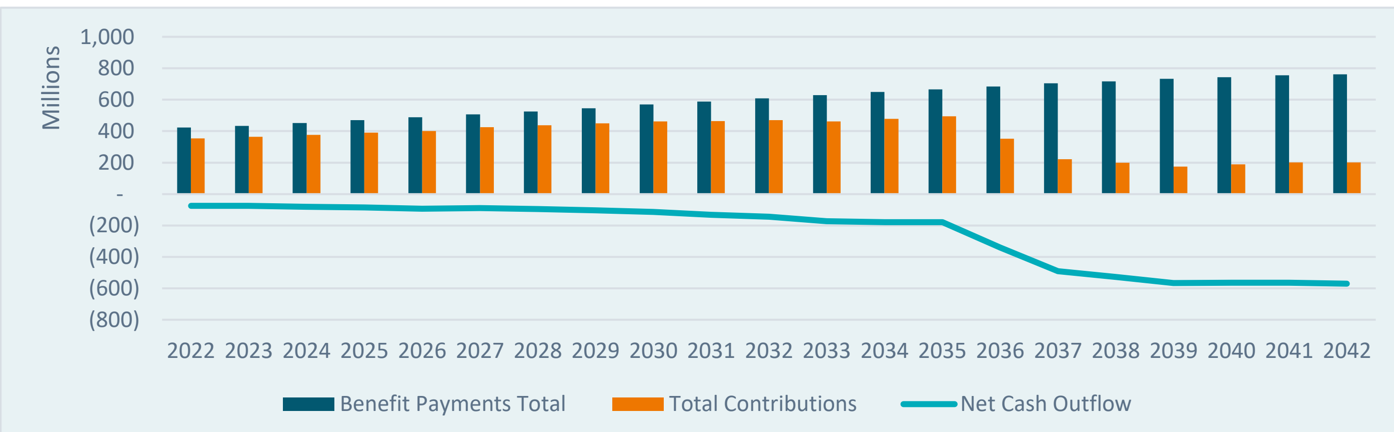
ACTIVE TO INACTIVE RATIO



Inactive count includes retirees, beneficiaries, and terminated vested members.

Assuming no plan growth, the proportion of active members to retirees declines steadily over the next 15 years then increases marginally.

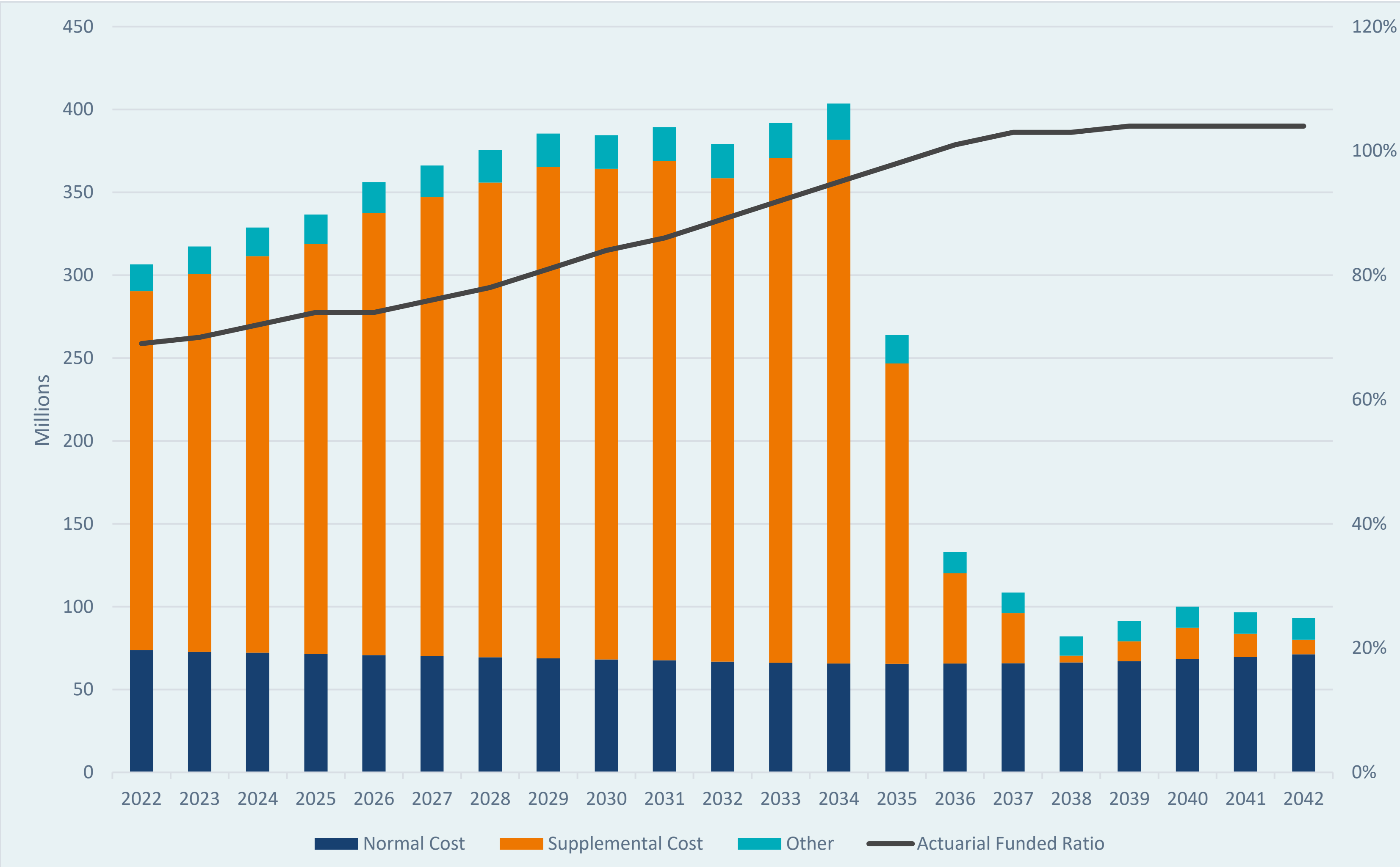
BENEFIT PAYMENTS, CONTRIBUTIONS, AND OUTFLOW



Includes employer and employee contributions projected at a return of 7.0%.

As plan funding improves and the pool grows larger, there is a greater reliance on investments to meet cashflow needs.

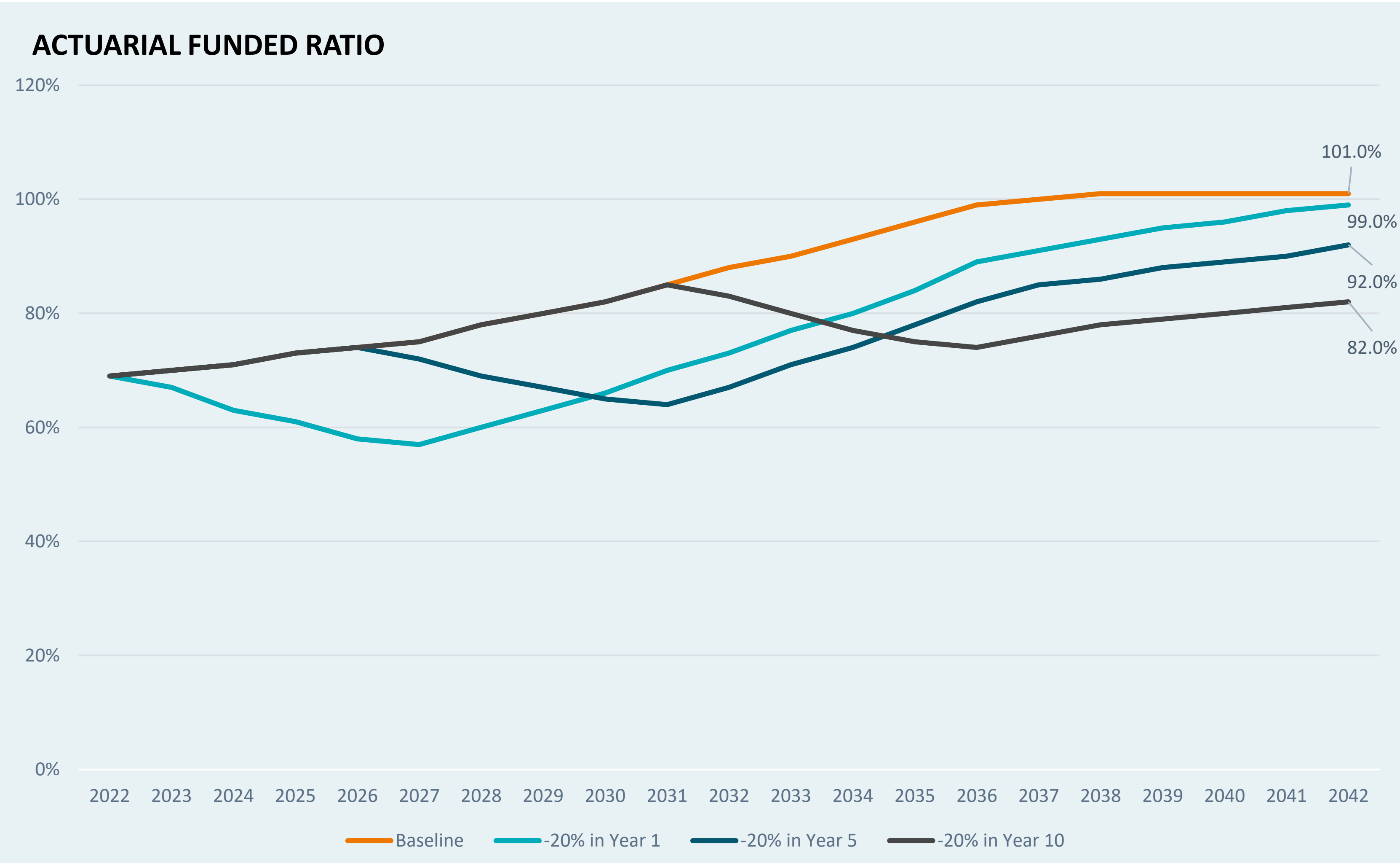
Projected employer contributions



Once funded status approaches 100%, the employer contributions related to the unfunded actuarial accrued liability (UAAL) decline

Employer contributions are composed of normal cost, supplemental cost, admin expenses, and interest on contributions. The label "Other" includes admin expenses and interest on contributions.

Impact of drawdowns

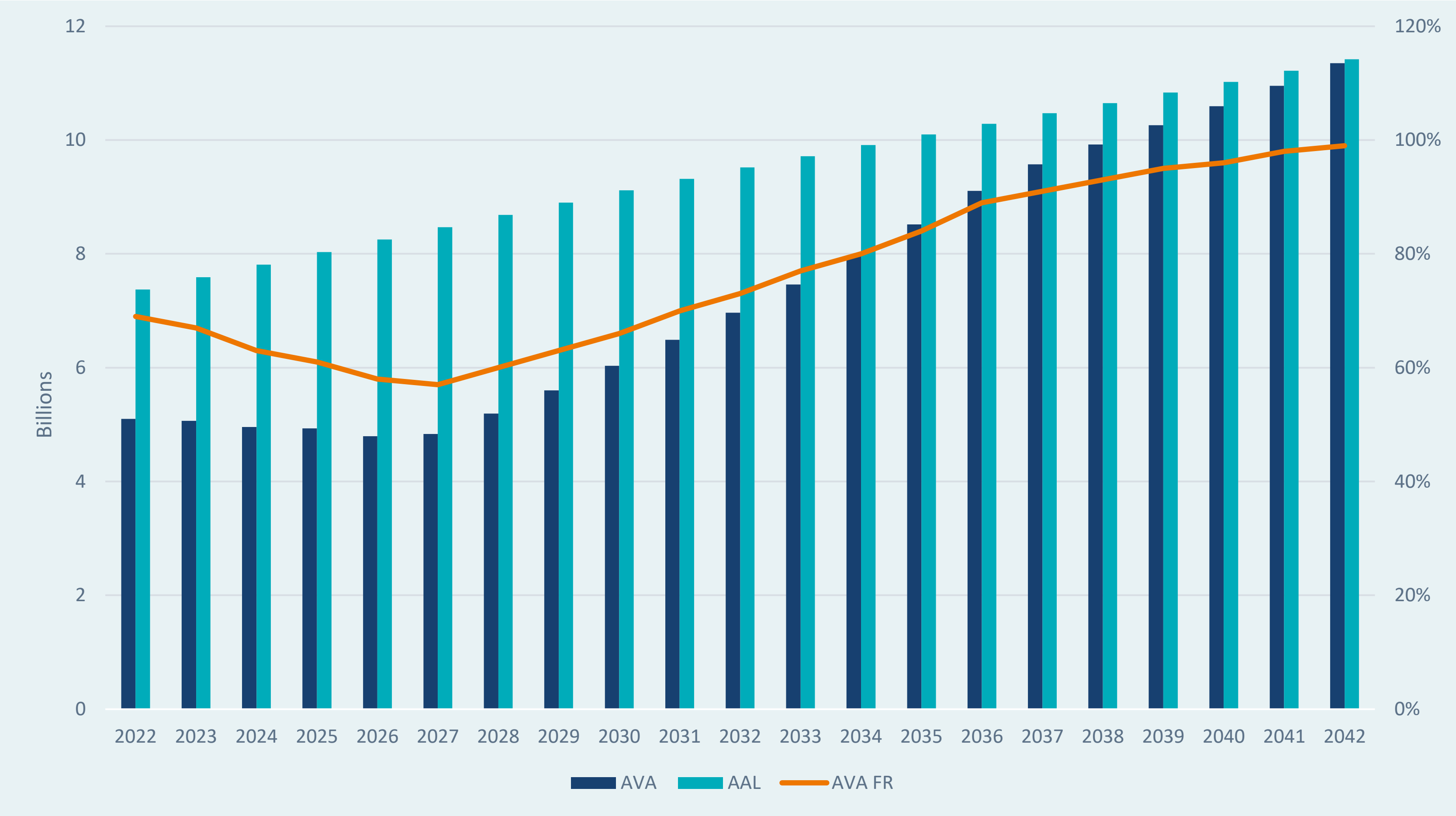


A 20% drawdown this year has a materially different impact than a 20% drawdown in year 10

Baseline scenario assumes a 7.0% return.

Immediate 20% drawdown projection

Agg. deterministic projection (-20% Yr 1, 7.0% Thereafter)

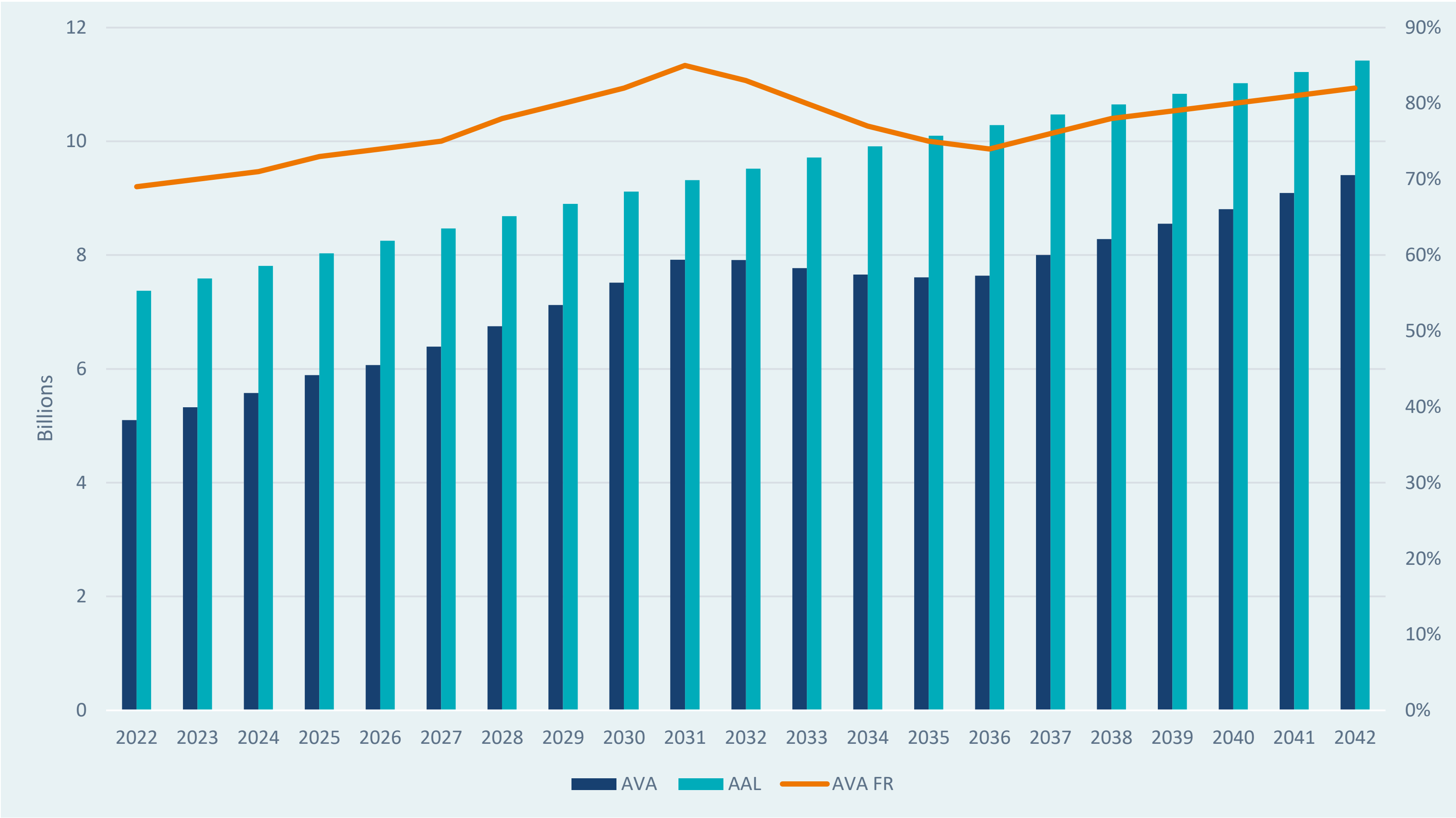


A 20% drawdown in year 1 extends fully funded status from 2037 to beyond 2042.

Assumes -20% return in year 1 and stated return in each projection year thereafter. Assumes discount rate is equal to projected return. AVA FR=funded ratio using actuarial value of assets

Delayed 20% drawdown projection

Agg. deterministic projection (-20% Yr 10, 7.0% Thereafter)

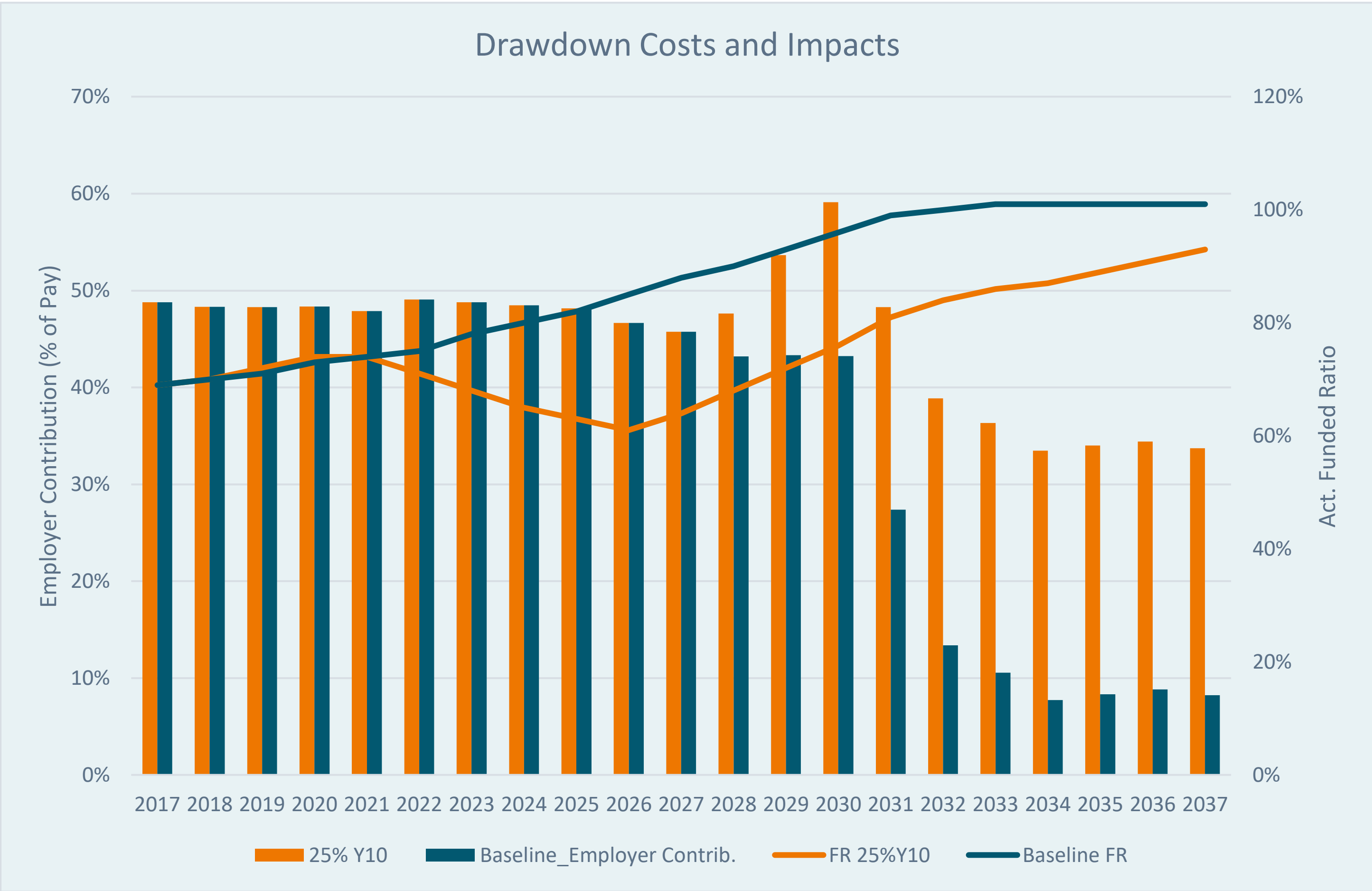


A 20% drawdown in year 10 extends fully funded status out past the 20-year projection.

Assumes -20% return in year 1 and stated return in each projection year thereafter. Assumes discount rate is equal to projected return. AVA FR=funded ratio using actuarial value of assets
KCERA benefits are more expensive relative to payroll and contribution rate. Assumes current contribution rates in projections.

Drawdown and funding policy

IMPACT OF 25% DRAWDOWN ON CONTRIBUTIONS (7.0% INVESTMENT RETURN OTHERWISE)



A significant drawdown may require an adjustment to the current funding policy.

Assumes a year-to-year return of 7.0% before and after the one-year drawdown of 25%. Assumes stated return in each projection year. Assumes discount rate is equal to projected return. AVA FR=funded ratio using actuarial value of assets, Data reflects actuarial values. Assumes current contribution rates in projections (employer contributions are normal cost + contribution to (UAAL)).

Stochastic forecasts
(random-value variables)

Alternative portfolios for consideration

	Current Dec 2022	Policy Apr 2022	Recommended Mix	80-20	70-30	60-40	Verus 2023 CMA's (10 Yr) Return (g)	Return (a)	Standard Deviation	Sharpe Ratio (a)
Global Equity	31.3	37.0	33.0	80.0	70.0	60.0	*7.4*	*8.7*	*17.1*	*0.32*
Total Equity	***31***	***37***	***33***	***80***	***70***	***60***				
CORE	**15**	**14**	**15**	**20**	**30**	**40**				
Core Fixed Income	3.1	6.0	4.0	0.0	0.0	0.0	4.3	4.4	4.6	0.24
Core Plus Fixed Income	5.5	8.0	0.0	20.0	30.0	40.0	4.6	4.7	4.6	0.28
US Treasury	6.7	0.0	3.0	0.0	0.0	0.0	3.8	4.0	7.1	0.10
US Long Treasury	0.0	0.0	4.0	0.0	0.0	0.0	3.8	4.6	13.2	0.10
Investment Grade Credit	0.0	0.0	4.0	0.0	0.0	0.0	*4.3*	*4.4*	*3.7*	*0.30*
CREDIT	**9**	**10**	**10**	**0**	**0**	**0**				
High Yield Corp. Credit	3.2	6.0	0.0	0.0	0.0	0.0	6.4	7.0	11.2	0.33
Bank Loans	0.0	0.0	2.5	0.0	0.0	0.0	6.8	7.2	9.2	0.42
Emerging Market Debt (Hard)	2.0	2.0	2.5	0.0	0.0	0.0	8.9	9.4	10.7	0.57
Emerging Market Debt (Local)	2.0	2.0	0.0	0.0	0.0	0.0	7.0	7.7	12.3	0.36
Securitized Credit	1.8	0.0	5.0	0.0	0.0	0.0	5.2	5.3	3.4	0.58
Total Fixed Income	***24***	***24***	***25***	***20***	***30***	***40***				
Commodities	3.9	4.0	4.0	0.0	0.0	0.0	5.7	6.9	16.3	0.22
Core Real Estate	6.9	5.0	5.0	0.0	0.0	0.0	5.8	6.5	12.6	0.25
Value Add Real Estate	2.3	5.0	5.0	0.0	0.0	0.0	7.8	8.9	15.5	0.36
Midstream	5.8	5.0	5.0	0.0	0.0	0.0	6.2	10.1	30.1	0.23
Total Real Assets	***19***	***19***	***19***	***0***	***0***	***0***				
Hedge Fund	15.9	18.0	18.0	0.0	0.0	0.0	4.6	4.9	7.7	0.21
Private Equity	2.8	5.0	5.0	0.0	0.0	0.0	9.2	12.1	25.8	0.34
Private Credit[1]	4.7	5.0	8.0	0.0	0.0	0.0				
Opportunistic[2]	3.3	0.0	0.0	0.0	0.0	0.0				
Total Non-Public Investments	***27***	***28***	***31***	***0***	***0***	***0***				
Cash	-1.2	-8.0	-8.0	0.0	0.0	0.0	3.3	3.3	1.2	-
Total Allocation	**100**	**100**	**100**	**100**	**100**	**100**				

Mean Variance Analysis						
Forecast 10 Year Return	***6.9***	***7.2***	***7.3***	***7.0***	***6.8***	***6.5***
Standard Deviation	11.4	12.8	12.0	14.4	12.9	11.4
Return/Std. Deviation	*0.6*	*0.6*	*0.6*	*0.5*	*0.5*	*0.6*
1st percentile ret. 1 year	*-16.2*	*-18.5*	*-16.7*	*-21.5*	*-19.1*	*-16.8*
Sharpe Ratio	0.36	0.36	0.37	0.31	0.32	0.33

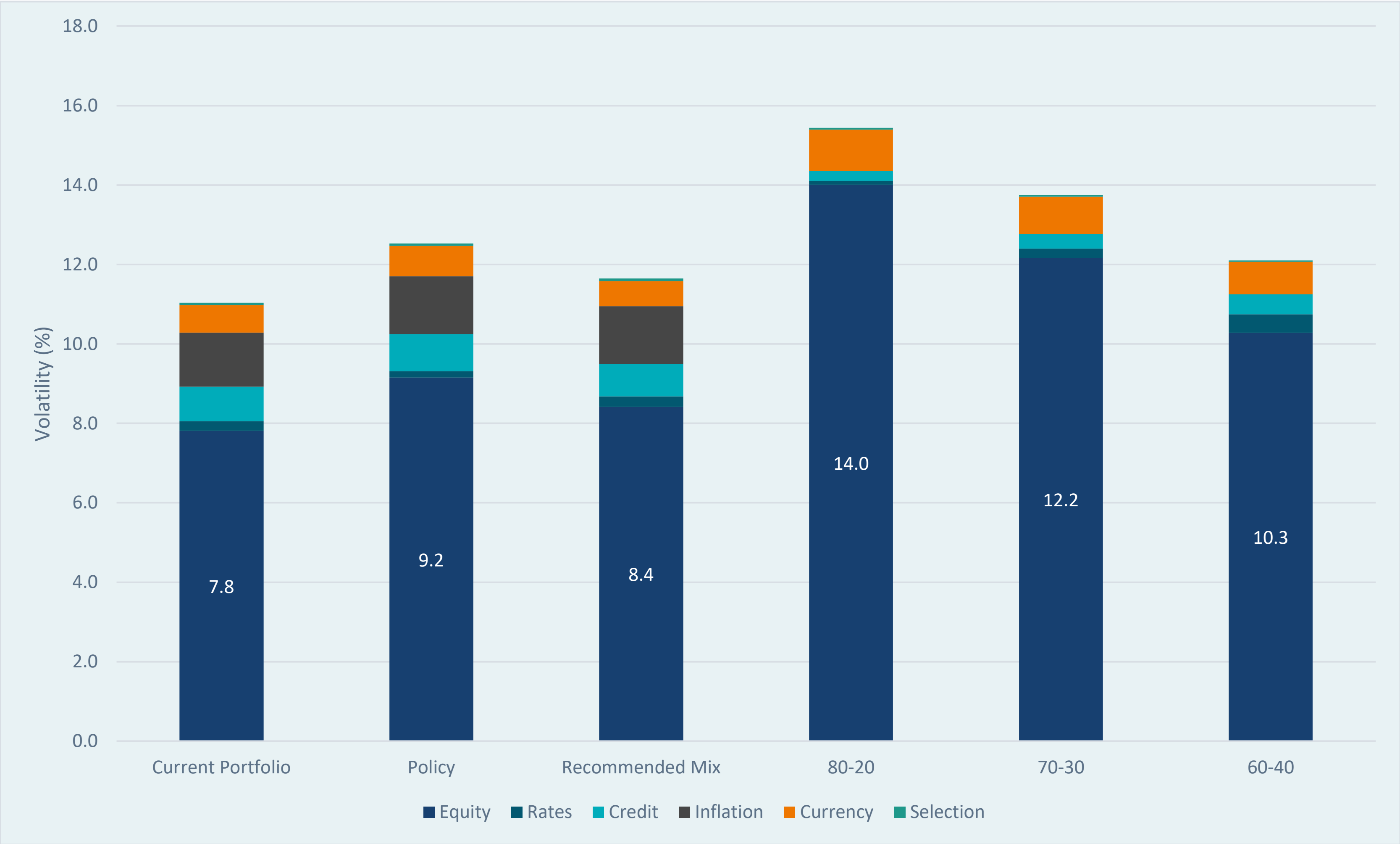
Source: Verus/MPI; Current Portfolio as of 12/31/22

[1] The Private Credit allocation is modeled using a mix of Direct Lending, Credit Opps., and Distressed CMAs.

[2] The Opportunistic allocation is modeled in the Current Portfolio mix using a mix of Private Credit and Global Equity CMAs to align with estimated portfolio betas.

Risk decomposition

RISK FACTOR DECOMPOSITION



Majority of risk in portfolio is sourced from equity factors.

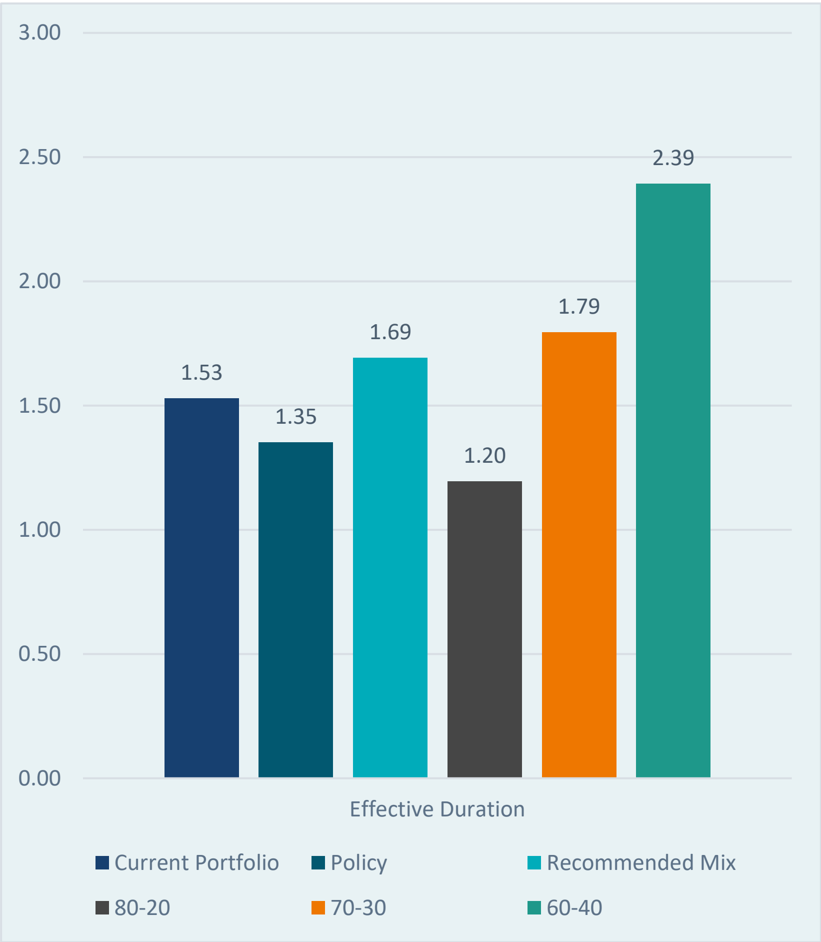
Source: MSCI BarraOne

Note: Selection Risk is the risk attributable to unassigned factors

Sources of risk

EQUITY BETA

PORTFOLIO EFFECTIVE DURATION (YEARS)

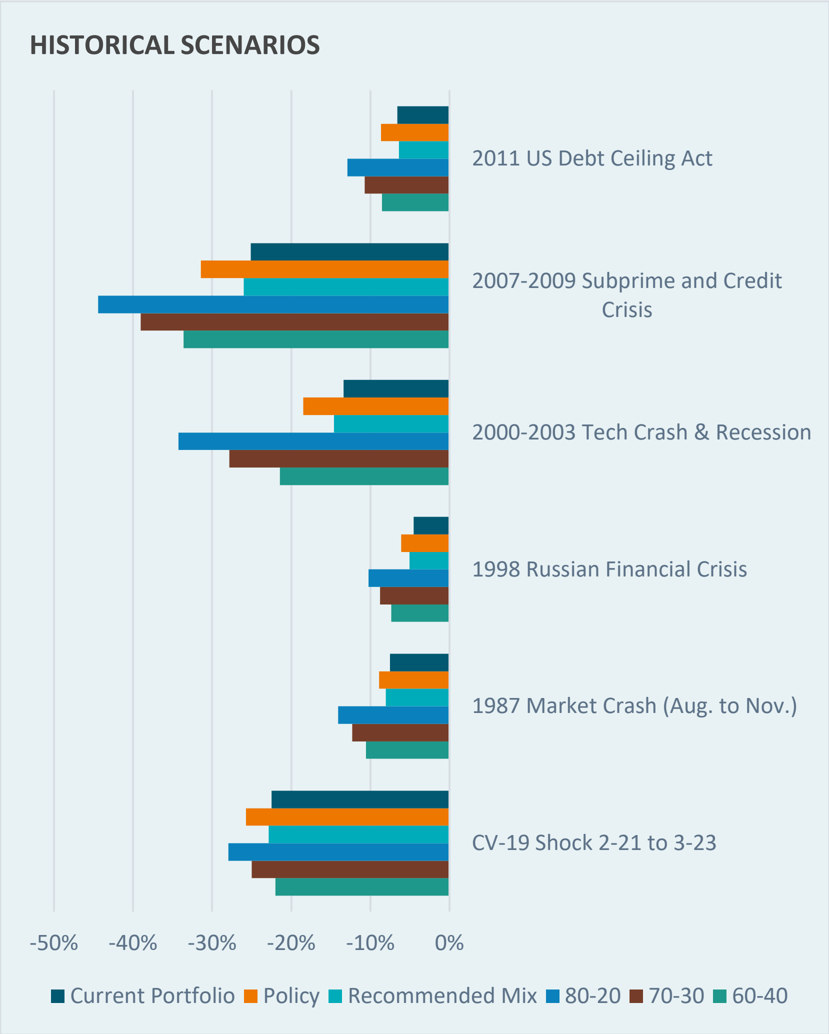


Equity beta measures the sensitivity to the risks of the broad equity market.

Duration measures the sensitivity of the portfolio to a change in interest rates.

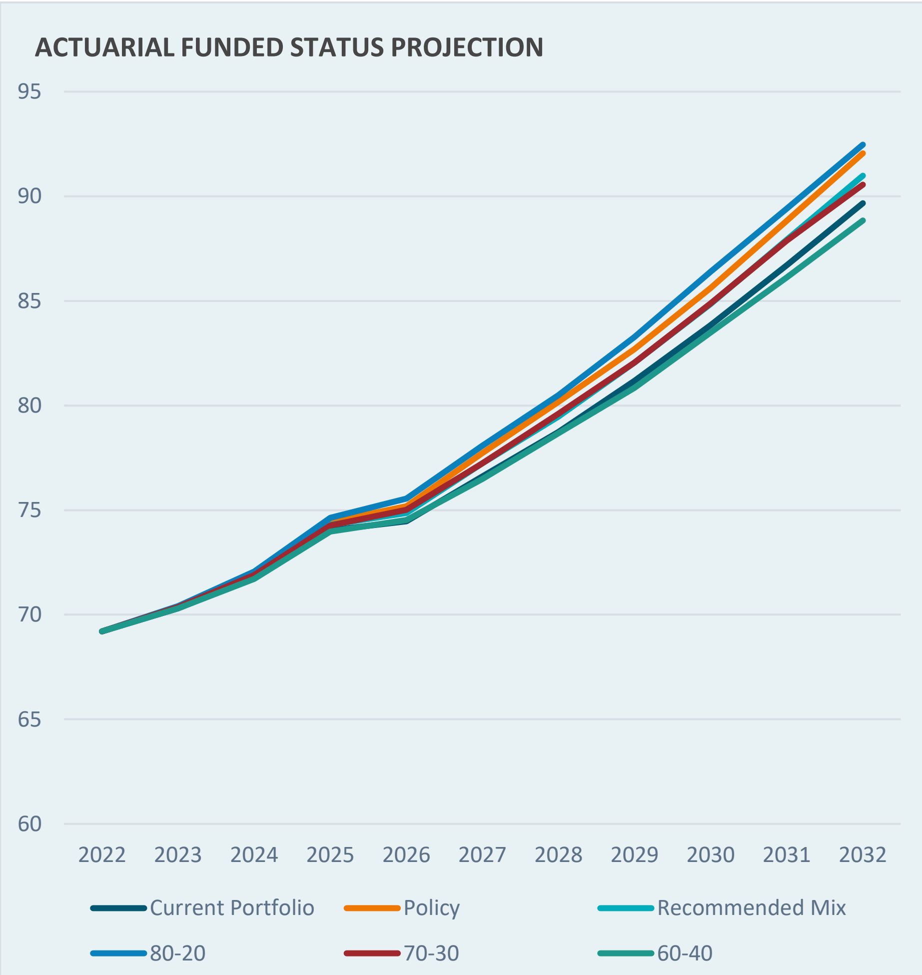
Source: MSCI BarraOne

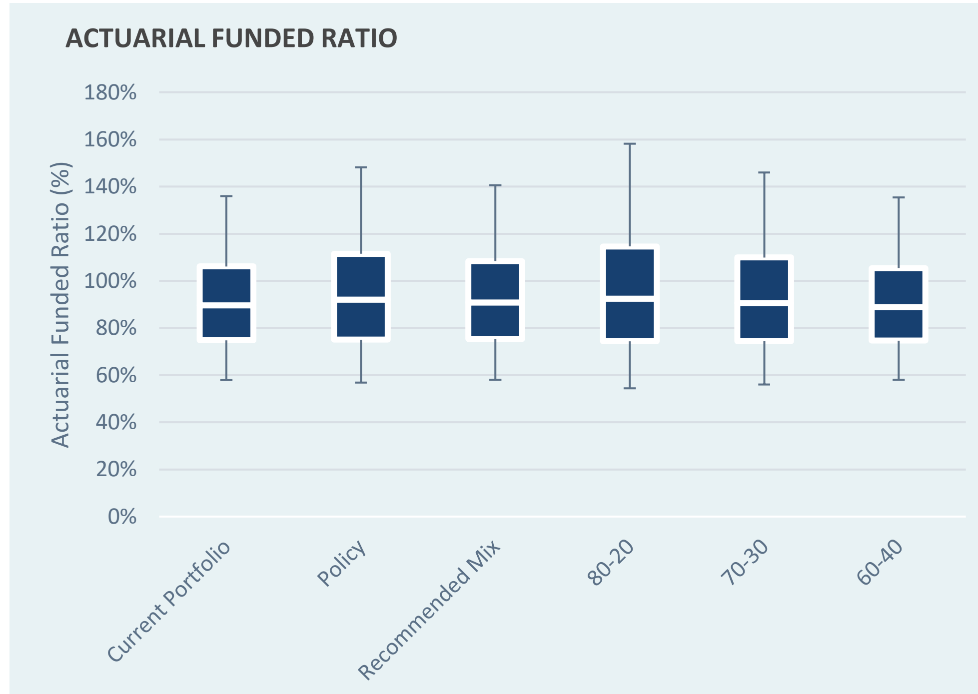
Scenario analysis and stress tests



Source: MSCI BARRA

Funded ratio projections

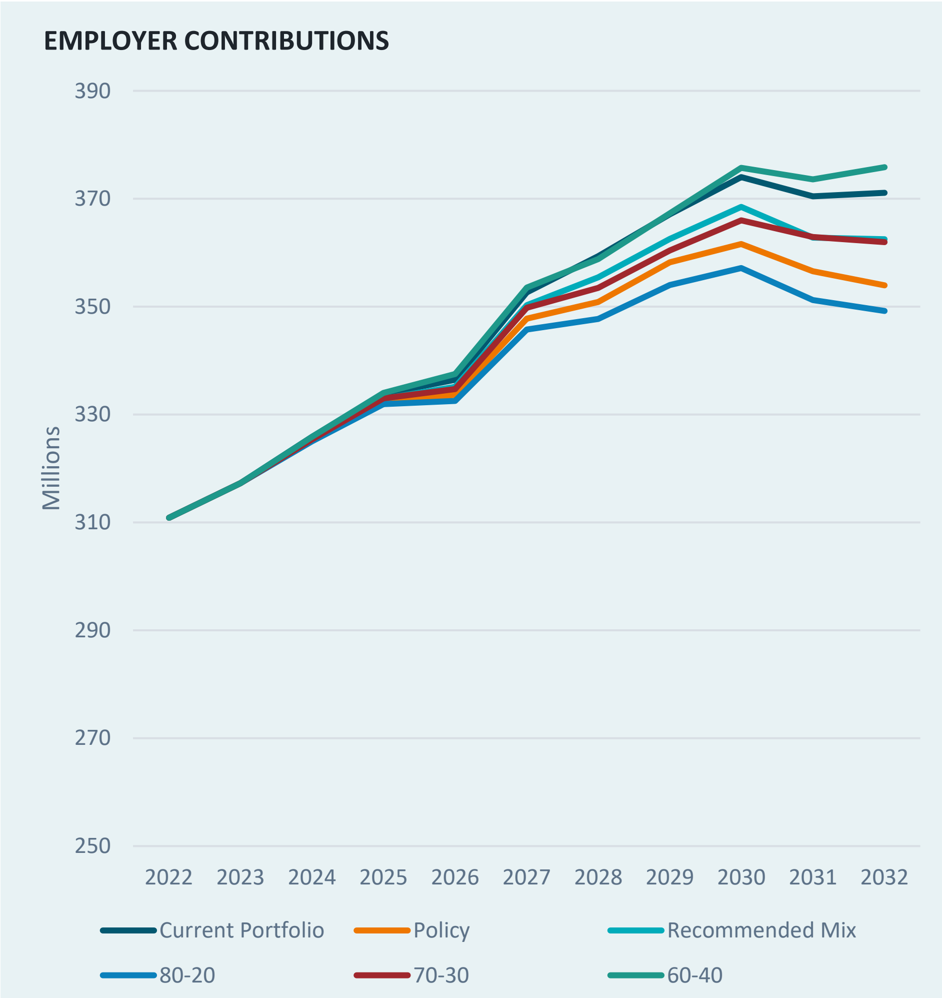


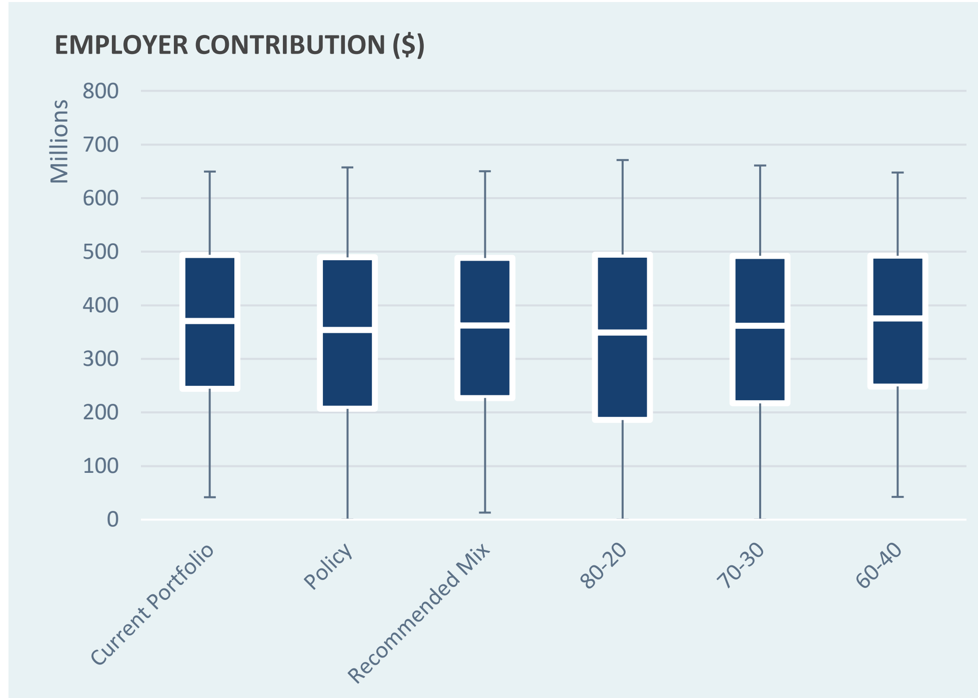


	Current Portfolio	Policy	Recommended Mix	80-20	70-30	60-40
Best Case (95%)	135.9%	148.1%	141.1%	158.2%	146.0%	135.5%
Median Outcome (50%)	89.7%	92.1%	91.0%	92.5%	90.6%	88.9%
Worst Case (5%)	58.0%	56.9%	58.0%	54.4%	56.1%	58.1%

Source: ProVal. Based on a 5,000-independent monte-carlo simulations.

Employer contribution projections

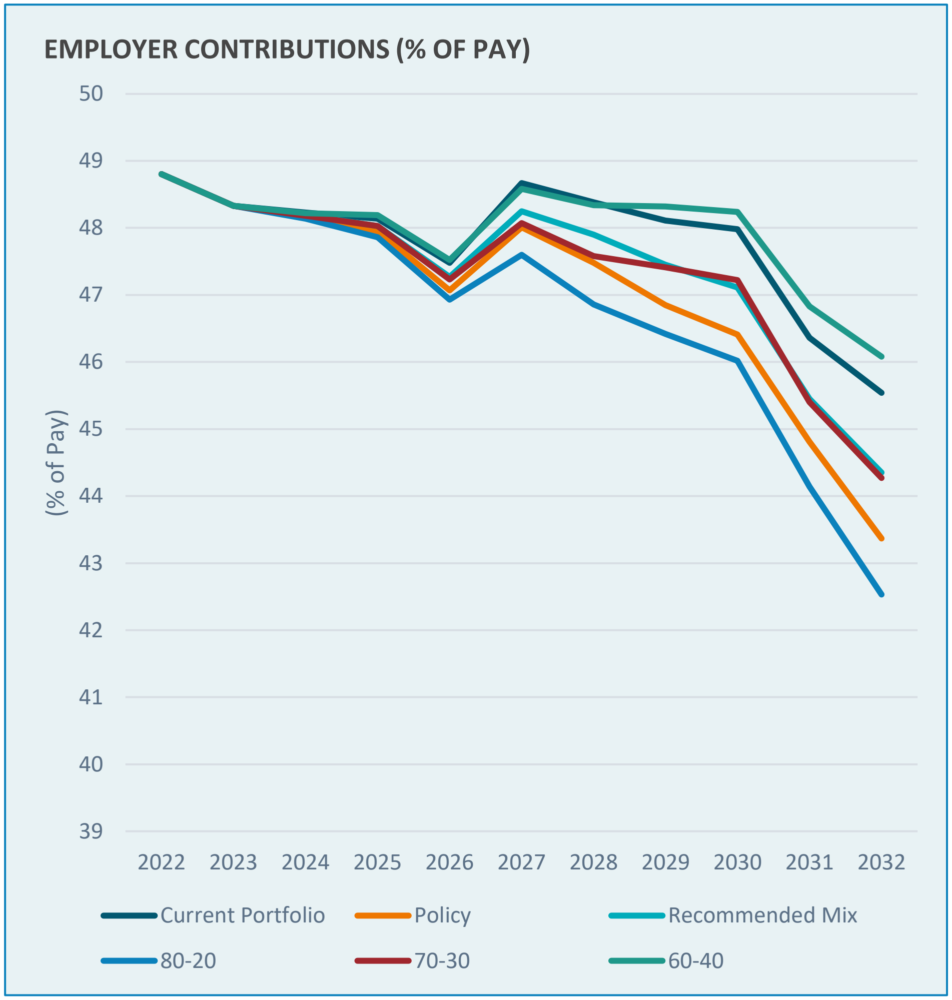


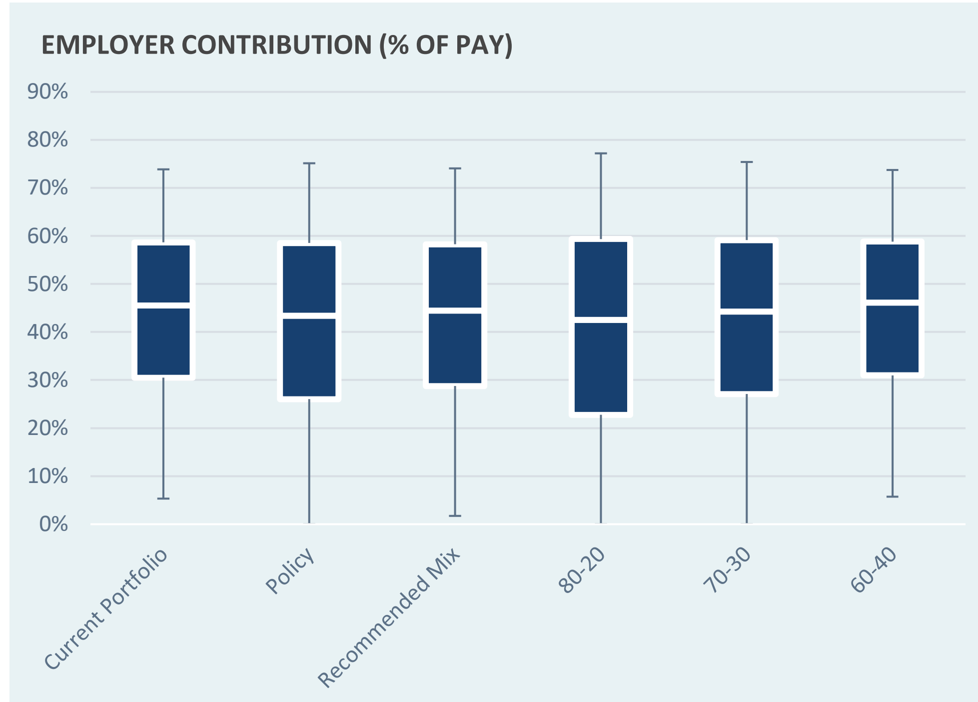


	Current Portfolio	Policy	Recommended Mix	80-20	70-30	60-40
Worst Case (95%)	649	657	651	671	661	648
Median Outcome (50%)	371	354	362	349	362	376
Best Case (5%)	42	0	11	0	0	43

Source: ProVal. Based on a 5,000-independent monte-carlo simulations.

Employer contribution (% Pay) projections





	Current Portfolio	Policy	Recommended Mix	80-20	70-30	60-40
Worst Case (95%)	73.9%	75.1%	74.2%	77.2%	75.4%	73.7%
Median Outcome (50%)	45.5%	43.4%	44.4%	42.5%	44.3%	46.1%
Best Case (5%)	5.3%	0.0%	1.3%	0.0%	0.0%	5.7%

Source: ProVal. Based on a 5,000-independent monte-carlo simulations.

Liquidity assessment

Liquidity should be managed to reasonably ensure the fund can meet its obligations during periods of market dislocations

To gauge the health of KCERA's current liquidity position we leverage a cash-flow based analysis that is rooted in the Basel 3 banking regulation framework.

Determining the "right" liquidity coverage ratio (LCR)

— There is no "right" LCR but a value less than 1 means there is insufficient liquidity to meet cash flow needs.

— The target LCR is impacted by several variables:

- Access to external sources of liquidity (i.e. line of credit)
- Projected cash flows into/out of the portfolio and the volatility of those cash flows
- Overall risk tolerance

Maintaining an LCR above 1 would imply there is sufficient liquidity to meet benefit, expense, and capital call obligations

Liquidity coverage ratio (LCR)

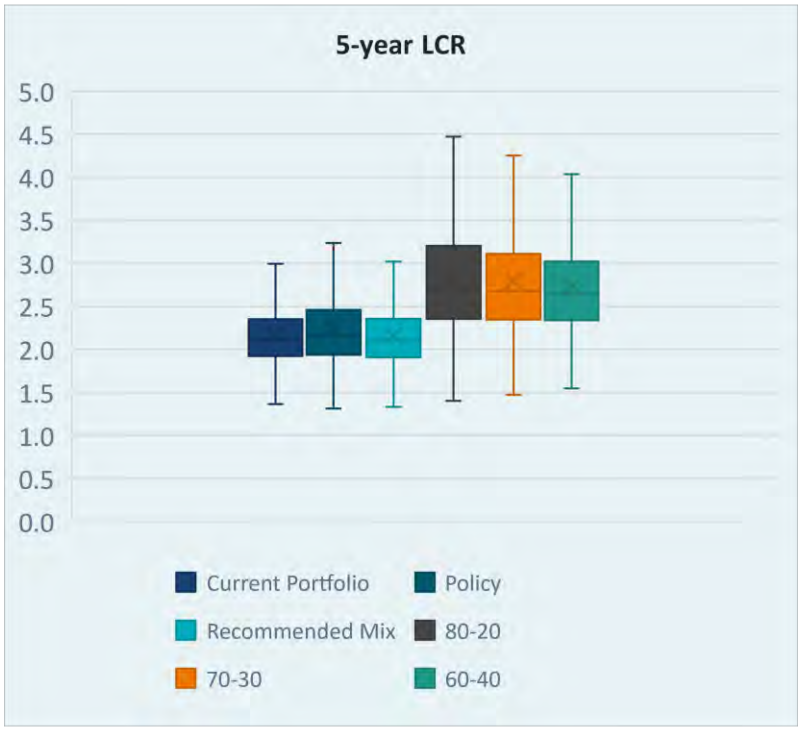
Do you need to sell illiquid assets to cover cash outflows in the next 5 years?

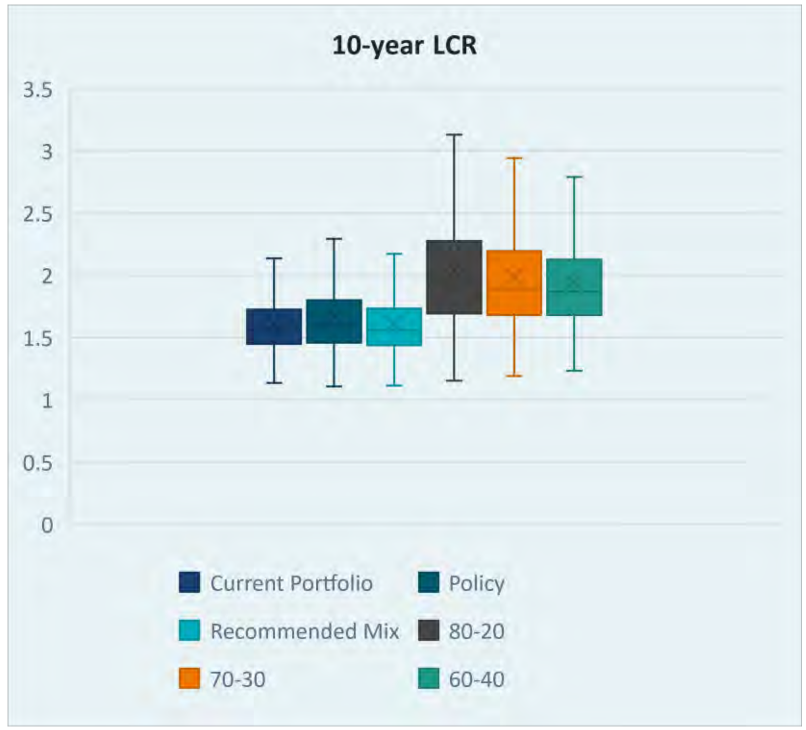
$$Liquidity\ Coverage\ Ratio\ (LCR) = \frac{\begin{matrix} Liquid\ Financial\ Assets\ (normal\ market\ condition) \\ \sum(Distributions\ from\ Illiquid\ Assets) \\ \sum(Gifts/Contributions) \\ \sum(Investment\ Income) \end{matrix}}{\begin{matrix} \sum(Spending\ Policy) \\ \sum(Capital\ Calls\ for\ Illiquid\ Assets) \\ \sum(Plan\ Expenses) \end{matrix}}$$

LCR Value	Implication
<1	The plan will need to sell illiquid assets to cover cash flows
1	The plan has sufficient liquidity to cover all cash flows
>1	The plan will not be required to sell illiquid assets to cover liquidity needs

Liquidity coverage analysis

- Verus analyzed KCERA's liquidity risk through a liquidity coverage ratio (LCR) framework.
- In the LCR analysis, the Plan's liquid assets are summed with expected cash inflow and then divided by expected cash outflow.
- The Plan is expected to have sufficient liquidity to make benefit payments over the next 10 years (even in extreme market conditions).





An LCR greater than 1 indicates the Plan should have sufficient liquid assets to cover all cash outflows.

Heat map

	Current Portfolio	Policy	Recommended Mix	80-20	70-30	60-40
Risk/Return Metrics						
Expected Return	6.9%	7.2%	7.3%	7.0%	6.8%	6.5%
% chance of meeting 7.0%	50%	51%	51%	50%	49%	48%
Volatility	11.4%	12.8%	12.0%	14.4%	12.9%	11.4%
Sharpe Ratio	0.36	0.36	0.37	0.31	0.32	0.33
VaR (95% confidence)	-10.0%	-11.7%	-10.6%	-14.0%	-12.3%	-10.5%
2007-2009 Drawdown (Simulation)	-25.1%	-31.4%	-25.8%	-44.4%	-39.0%	-33.6%
1st Percentile (1 Year)	-16.2%	-18.5%	-16.7%	-21.5%	-19.1%	-16.8%
Other Key Metrics (Expected Yr. 10)						
$MM Contributions - Employer	$371	$354	$362	$349	$362	$376
% of Pay Cont. - Employer	45.5%	43.4%	44.4%	42.5%	44.3%	46.1%
Funded Ratio	89.7%	92.1%	91.0%	92.5%	90.6%	88.9%
Risk Factors						
Portfolio Complexity	med	med	med	low	low	low
Leverage	med	med	med	low	low	low
Peer Risk	low	low	low	med	low	low
Headline Risk	med	med	med	med	low	low
Liquidity Risk	med	med	med	low	low	low
Tail Risk	med	med	med	high	high	med
Equity Risk Allocation	med	med	med	high	high	high

Source: MPI, Barra, ProVal

Proposed policy allocation adjustments

CURRENT

Public Equity	37%	
Fixed Income	24%	
Core		14%
Credit		6%
EM Debt		4%
Commodities	4%	
Hedge Funds	10%	
Alpha Pool	8%	
Midstream	5%	
Core Real Estate	5%	
Private Markets	15%	
Private Equity		5%
Private Credit		5%
Private Real Estate		5%
Opportunistic		0%
Cash	-8%	
Total	**100%**	

-4%

+1%

14% Core+

6% High Yield

2.5% Hard
2.5% Local

+3%

PROPOSED

Public Equity	33%	
Fixed Income	25%	
Core		15%
Credit		10%
Commodities	4%	
Hedge Funds	10%	
Alpha Pool	8%	
Midstream	5%	
Core Real Estate	5%	
Private Markets	18%	
Private Equity		5%
Private Credit		8%
Private Real Estate		5%
Opportunistic		0%
Cash	-8%	
Total	**100%**	

4% Core
7% Treasuries
4% IG Credit

2.5% Bank Loans
5% Securitized Debt
2.5% Hard EMD

Proposed policy benchmark adjustments

Asset Class	Current Benchmark	Proposed Benchmark
Public Equity	MSCI ACWI IMI (Net)	No Change
Fixed Income	Allocation-Weighted Blend: Bloomberg US Aggregate, Ice BofA ML HY Master II, JPM EMBIGD, JPM GBI-EMGD	Allocation-Weighted Blend: Bloomberg US Aggregate, US Treas. 10+ Year, Bloomberg Credit 1-3 Year, Morningstar LTSA US Levered Loan, Bloomberg Securitized MBS/ABS/CMBS Index, JPM EMBIG Diversified
Commodities	Bloomberg Commodity Index	No Change
Hedge Funds	3-Month T-bills + 400 basis points and 25% MSCI ACWI (Net)	No Change
Alpha Pool	3-Month T-bills + 400 basis points	No Change
Midstream	Alerian Midstream Energy Index	No Change
Core Real Estate	NCREIF – Open End Diversified Core Equity	No Change
Private Equity	Actual time-weighted Private Equity return	No Change
Private Credit	Actual time-weighted Private Credit return	No Change
Private Real Estate	Actual time-weighted Private Real Estate returns	No Change
Opportunistic investments	Assumed Rate of Return + 300 bps	No Change
Cash	3-Month T-bill	No Change

Appendix

CMA Methodology

CORE INPUTS

— We use a fundamental building block approach based on several inputs, including historical data and academic research to create asset class return forecasts.
— For most asset classes, we use the long-term historical volatility after adjusting for autocorrelation.
— Correlations between asset classes are calculated based on the last 10 years. For illiquid assets, such as private equity and private real estate, we use BarraOne correlation estimates.

Asset	Return Methodology	Volatility Methodology*
Inflation	25% weight to the University of Michigan Survey 5-10 year ahead inflation expectation and the Survey of Professional Forecasters (Fed Survey), and the remaining 50% to the market's expectation for inflation as observed through the 10-year TIPS breakeven rate	-
Cash	75% * current federal funds rate + 25% * U.S. 10-year Treasury yield	Long-term volatility
Bonds	Nominal bonds: current yield; Real bonds: real yield + inflation forecast	Long-term volatility
International Bonds	Current yield	Long-term volatility
Credit	Current option-adjusted spread + U.S. 10-year Treasury – effective default rate	Long-term volatility
International Credit	Current option-adjusted spread + foreign 10-year Treasury – effective default rate	Long-term volatility
Private Credit	Levered gross return (LIBOR + spread + original issuance discounts) – management fees – carried interest	Estimated volatility
Equity	Current yield + real earnings growth (historical average) + inflation on earnings (inflation forecast) + expected P/E change	Long-term volatility
Intl Developed Equity	Current yield + real earnings growth (historical average) + inflation on earnings (intl. inflation forecast) + expected P/E change	Long-term volatility
Private Equity	US large cap domestic equity forecast * 1.85 beta adjustment	1.2 * Long-term volatility of U.S. small cap
Commodities	Collateral return (cash) + spot return (inflation forecast) + roll return (assumed to be zero)	Long-term volatility
Hedge Funds	Return coming from traditional betas + 15-year historical idiosyncratic return	Long-term volatility
Core Real Estate	Cap rate + real income growth – capex + inflation forecast	65% of REIT volatility
REITs	Core real estate	Long-term volatility
Value-Add Real Estate	Core real estate + 2%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Opportunistic Real Estate	Core real estate + 3%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Infrastructure	Current yield + real income growth + inflation on earnings (inflation forecast)	Long-term volatility
Risk Parity	Expected Sharpe Ratio * target volatility + cash rate	Target volatility

**Long-term historical volatility data is adjusted for autocorrelation (see Appendix)*

10-year return & risk assumptions

Asset Class	Index Proxy	Ten Year Return Forecast Geometric	Ten Year Return Forecast Arithmetic	Standard Deviation Forecast	Sharpe Ratio Forecast (g)	Sharpe Ratio Forecast (a)	10-Year Historical Sharpe Ratio (g)	10-Year Historical Sharpe Ratio (a)
Equities								
U.S. Large	S&P 500	6.5%	7.6%	15.6%	0.21	0.28	0.76	0.79
U.S. Small	Russell 2000	5.4%	7.5%	21.5%	0.10	0.20	0.42	0.49
International Developed	MSCI EAFE	9.1%	10.5%	17.8%	0.33	0.40	0.21	0.27
International Small	MSCI EAFE Small Cap	9.2%	11.3%	22.1%	0.27	0.36	0.29	0.36
Emerging Markets	MSCI EM	8.5%	11.2%	25.2%	0.21	0.31	0.02	0.10
Global Equity	MSCI ACWI	7.4%	8.7%	17.1%	0.23	0.32	0.47	0.52
Global Equity ex-US	MSCI ACWI ex-US	9.0%	10.7%	19.9%	0.29	0.37	0.16	0.23
Private Equity	CA U.S. Private Equity	9.2%	12.1%	25.8%	0.23	0.34	-	-
Private Equity Direct	CA U.S. Private Equity	10.2%	13.0%	25.8%	0.27	0.38	-	-
Private Equity (FoF)	CA U.S. Private Equity	8.2%	11.1%	25.8%	0.19	0.30	-	-
Fixed Income								
Cash	30 Day T-Bills	3.3%	3.3%	1.2%	-	-	-	-
U.S. TIPS	Bloomberg U.S. TIPS 5-10	4.1%	4.3%	5.6%	0.14	0.18	0.06	0.08
U.S. Treasury	Bloomberg Treasury 7-10 Year	3.8%	4.0%	7.1%	0.07	0.10	(0.02)	0.01
Long U.S. Treasury	Bloomberg Treasury 20+ Year	3.8%	4.6%	13.2%	0.04	0.10	(0.01)	0.05
Global Sovereign ex U.S.	Bloomberg Global Treasury ex U.S.	2.2%	2.7%	10.0%	(0.11)	(0.06)	(0.47)	(0.44)
Global Aggregate	Bloomberg Global Aggregate	3.0%	3.2%	6.7%	(0.05)	(0.01)	(0.30)	(0.28)
Core Fixed Income	Bloomberg U.S. Aggregate Bond	4.3%	4.4%	4.6%	0.22	0.24	0.05	0.07
Core Plus Fixed Income	Bloomberg U.S. Universal	4.6%	4.7%	4.6%	0.28	0.30	0.17	0.14
Short-Term Gov't/Credit	Bloomberg U.S. Gov't/Credit 1-3 Year	3.9%	4.0%	3.7%	0.16	0.19	0.11	0.11
Short-Term Credit	Bloomberg Credit 1-3 Year	4.3%	4.4%	3.7%	0.27	0.30	0.40	0.40
Long-Term Credit	Bloomberg Long U.S. Credit	5.3%	5.9%	11.0%	0.18	0.24	0.11	0.16
High Yield Corp. Credit	Bloomberg U.S. Corporate High Yield	6.4%	7.0%	11.2%	0.28	0.33	0.44	0.47
Bank Loans	S&P/LSTA Leveraged Loan	6.8%	7.2%	9.2%	0.38	0.42	0.53	0.54
Global Credit	Bloomberg Global Credit	4.5%	4.8%	7.9%	0.15	0.19	0.00	0.03
Emerging Markets Debt (Hard)	JPM EMBI Global Diversified	8.9%	9.4%	10.7%	0.52	0.57	0.05	0.09
Emerging Markets Debt (Local)	JPM GBI-EM Global Diversified	7.0%	7.7%	12.3%	0.30	0.36	(0.28)	(0.23)
Private Credit	S&P LSTA Leveraged Loan Index	8.2%	9.0%	13.0%	0.38	0.44	-	-
Private Credit (Direct Lending - Unlevered)	S&P LSTA Leveraged Loan Index	6.8%	7.2%	9.2%	0.38	0.42	-	-
Private Credit (Direct Lending - Levered)	S&P LSTA Leveraged Loan Index	9.1%	10.1%	15.3%	0.38	0.44	-	-
Private Credit (Credit Opportunities)	S&P LSTA Leveraged Loan Index	8.5%	9.4%	13.8%	0.38	0.44	-	-
Private Credit (Junior Capital / Mezzanine)	S&P LSTA Leveraged Loan Index	9.0%	10.0%	15.1%	0.38	0.44	-	-
Private Credit (Distressed)	S&P LSTA Leveraged Loan Index	9.1%	12.7%	29.1%	0.20	0.32	-	-

Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

10-year return & risk assumptions

Asset Class	Index Proxy	Ten Year Return Forecast: Geometric	Ten Year Return Forecast: Arithmetic	Standard Deviation Forecast	Sharpe Ratio Forecast (g)	Sharpe Ratio Forecast (a)	10-Year Historical Sharpe Ratio (g)	10-Year Historical Sharpe Ratio (a)
Other								
Commodities	Bloomberg Commodity	5.7%	6.9%	16.3%	0.15	0.22	(0.20)	(0.13)
Hedge Funds	HFRI Fund Weighted Composite	4.6%	4.9%	7.7%	0.17	0.21	0.70	0.71
Hedge Fund of Funds	HFRI Fund of Funds Composite	3.6%	3.9%	7.7%	0.04	0.08	-	-
Hedge Funds (Equity Style)	Custom HFRI Benchmark Mix*	7.4%	8.4%	14.6%	0.28	0.35	-	-
Hedge Funds (Credit Style)	Custom HFRI Benchmark Mix*	7.1%	7.5%	9.8%	0.39	0.43	-	-
Hedge Funds (Asymmetric Style)	Custom HFRI Benchmark Mix*	4.8%	4.9%	4.8%	0.31	0.33	-	-
Real Estate Debt	Bloomberg CMBS IG	5.2%	5.5%	7.5%	0.25	0.29	0.26	0.28
Core Real Estate	NCREIF Property	5.8%	6.5%	12.6%	0.20	0.25	1.94	1.87
Value-Add Real Estate	NCREIF Property + 200bps	7.8%	8.9%	15.5%	0.29	0.36	-	-
Opportunistic Real Estate	NCREIF Property + 300bps	8.8%	10.8%	21.3%	0.26	0.35	-	-
REITs	Wilshire REIT	5.8%	7.5%	19.4%	0.13	0.22	0.32	0.40
Global Infrastructure	S&P Global Infrastructure	7.8%	9.1%	17.3%	0.26	0.34	0.28	0.35
Risk Parity**	S&P Risk Parity 10% Vol Index	8.3%	8.8%	10.0%	0.50	0.55	-	-
Currency Beta	MSCI Currency Factor Index	1.6%	1.7%	3.4%	(0.49)	(0.46)	0.20	0.21
Inflation		2.5%	-	-	-	-	-	-

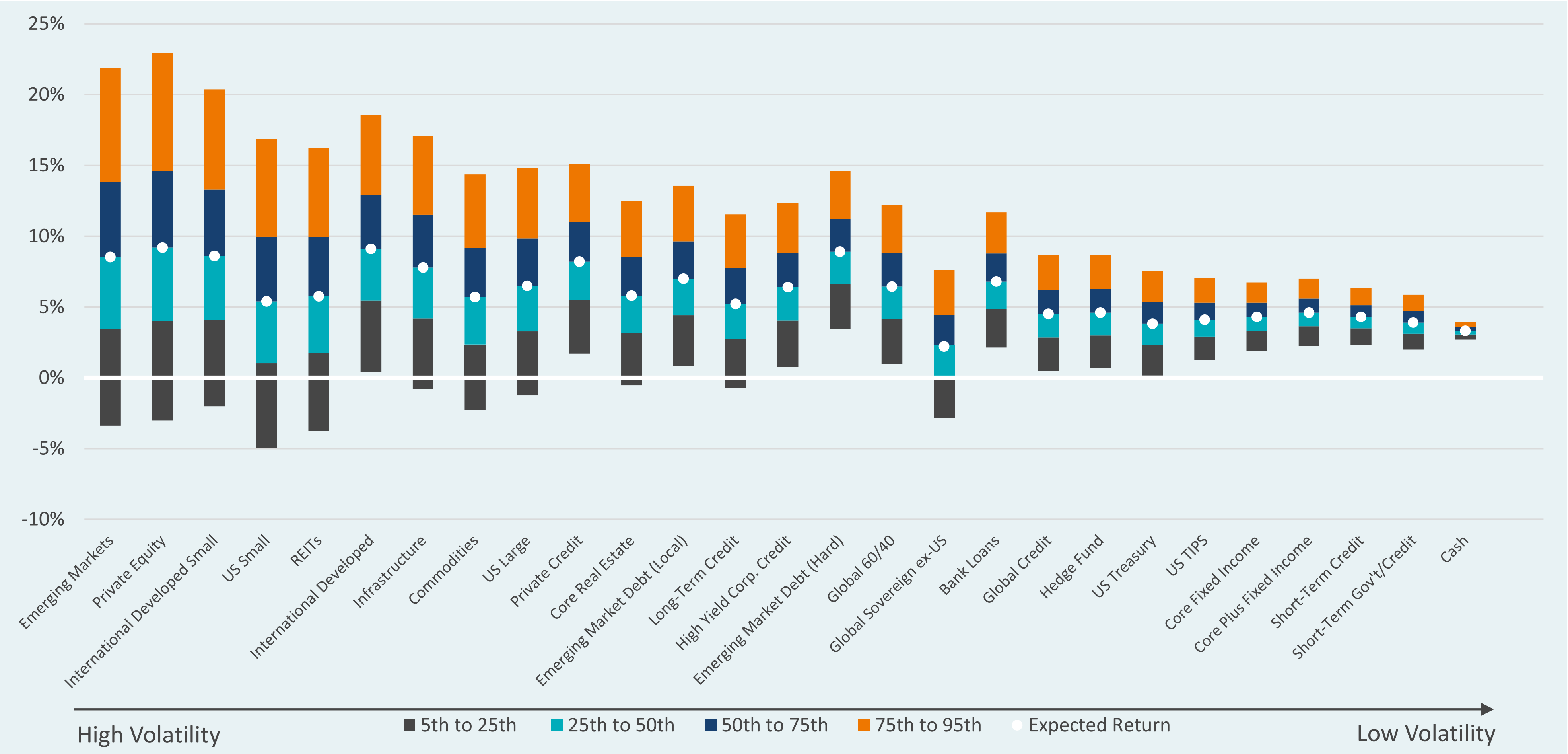
Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

**To represent hedge fund styles, we use a combination of HFRI benchmarks: Equity Style = 33% HFRI Fundamental Growth, 33% HFRI Fundamental Value, 33% HFRI Activist. Credit Style = 20% HFRI Distressed/Restructuring, 20% HFRI Credit Arbitrage, 20% HFRI Fixed Income-Corporate, 20% HFRI Fixed Income-Convertible Arbitrage, 20% HFRI Fixed Income-Asset Backed. Asymmetric Style = 50% HFRI Relative Value, 50% HFRI Macro*

***The Risk Parity forecast shown here assumes a 10% target volatility strategy. We recommend customizing this forecast to the target volatility specifications of the risk parity strategy that an investor wishes to model. Please speak with your Verus consultant for customization needs.*

Range of likely 10-year outcomes

10-YEAR RETURN 90% CONFIDENCE INTERVAL



Source: Verus, MPI

Correlation assumptions

	Cash	US Large	US Small	Intl Large	Intl Small	EM	Global Equity	PE	US TIPS	US Treasury	Global Sovereign ex-US	US Core	Core Plus	Short-Term Gov't/Credit	Short-Term Credit	Long-Term Credit	US HY	Bank Loans	Global Credit	EMD USD	EMD Local	Commodities	Hedge Funds	Real Estate	REITs	Infrastructure	Risk Parity	Currency Beta
Cash	1.0																											
US Large	-0.2	1.0																										
US Small	-0.2	0.9	1.0																									
Intl Large	-0.2	0.9	0.8	1.0																								
Intl Small	-0.3	0.9	0.8	1.0	1.0																							
EM	-0.2	0.7	0.6	0.8	0.8	1.0																						
Global Equity	-0.2	1.0	0.9	1.0	0.9	0.8	1.0																					
PE	-0.2	0.7	0.6	0.6	0.6	0.6	0.7	1.0																				
US TIPS	0.0	0.4	0.3	0.4	0.4	0.4	0.4	0.2	1.0																			
US Treasury	0.2	0.0	-0.1	0.0	0.0	0.0	0.0	-0.2	0.8	1.0																		
Global Sovereign ex-US	0.1	0.0	-0.2	-0.1	-0.1	0.0	-0.1	-0.2	0.7	0.9	1.0																	
US Core	0.0	0.3	0.2	0.4	0.4	0.5	0.4	0.1	0.7	0.6	0.5	1.0																
Core Plus	0.1	0.3	0.2	0.3	0.3	0.3	0.3	0.0	0.8	0.9	0.9	0.7	1.0															
Short-Term Gov't/Credit	0.0	0.4	0.3	0.4	0.4	0.4	0.4	0.1	0.9	0.8	0.8	0.7	1.0	1.0														
Short-Term Credit	0.2	0.1	0.1	0.2	0.2	0.2	0.2	-0.1	0.7	0.8	0.6	0.6	0.8	0.8	1.0													
Long-Term Credit	0.0	0.4	0.4	0.5	0.5	0.5	0.5	0.0	0.7	0.5	0.4	0.6	0.8	0.8	0.8	1.0												
US HY	0.0	0.5	0.4	0.5	0.5	0.5	0.5	0.1	0.7	0.6	0.7	0.6	0.8	0.9	0.6	0.7	1.0											
Bank Loans	-0.2	0.8	0.8	0.8	0.8	0.7	0.8	0.5	0.5	0.1	0.1	0.5	0.4	0.6	0.3	0.7	0.6	1.0										
Global Credit	-0.3	0.6	0.7	0.6	0.7	0.6	0.7	0.5	0.3	-0.2	-0.2	0.2	0.1	0.3	0.0	0.5	0.4	0.8	1.0									
EMD USD	-0.1	0.6	0.5	0.7	0.7	0.7	0.7	0.4	0.6	0.3	0.3	0.6	0.6	0.7	0.4	0.7	0.7	0.8	0.7	1.0								
EMD Local	0.0	0.5	0.4	0.7	0.6	0.8	0.6	0.4	0.5	0.2	0.1	0.6	0.4	0.5	0.3	0.5	0.5	0.7	0.5	0.8	1.0							
Commodities	-0.2	0.4	0.4	0.5	0.5	0.5	0.5	0.3	0.2	-0.3	-0.3	0.2	-0.1	0.0	-0.1	0.2	0.1	0.5	0.5	0.3	0.4	1.0						
Hedge Funds	-0.2	0.8	0.9	0.9	0.9	0.8	0.9	0.6	0.3	-0.2	-0.2	0.3	0.1	0.3	0.0	0.5	0.4	0.8	0.8	0.7	0.6	0.5	1.0					
Real Estate	-0.2	0.6	0.5	0.5	0.5	0.4	0.6	0.4	0.2	-0.1	-0.1	0.2	0.0	0.1	-0.1	0.1	-0.1	0.4	0.4	0.4	0.4	0.3	0.5	1.0				
REITs	-0.2	0.7	0.6	0.6	0.6	0.5	0.7	0.5	0.6	0.3	0.3	0.4	0.5	0.5	0.2	0.5	0.6	0.6	0.5	0.6	0.5	0.3	0.6	0.7	1.0			
Infrastructure	-0.2	0.8	0.7	0.8	0.8	0.7	0.8	0.7	0.5	0.1	0.0	0.5	0.3	0.5	0.2	0.5	0.6	0.8	0.7	0.7	0.7	0.5	0.8	0.3	0.7	1.0		
Risk Parity	-0.2	0.7	0.7	0.8	0.7	0.7	0.8	0.4	0.6	0.1	0.1	0.4	0.4	0.5	0.2	0.6	0.6	0.8	0.7	0.8	0.6	0.6	0.8	0.4	0.7	0.8	1.0	
Currency Beta	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.1	0.0	0.0	0.0	1.0

Note: as of 9/30/22 - Correlation assumptions are based on the last ten years. Private Equity and Real Estate correlations are especially difficult to model – we have therefore used BarraOne correlation data to strengthen these correlation estimates.

KCERA actuarial snapshot

Actuarial funded ratio (6/30/2022)	69.2%
Asset valuation method	Market value of assets (MVA) less unrecognized returns in each of the last five years. Unrecognized returns are equal to the difference between the actual market return and the expected return on a market value basis and are recognized semi-annually over a five-year period. The AVA cannot be less than 50% of MVA, nor greater than 150% of MVA. The Actuarial Value of Assets (AVA) is reduced by the value of the non-valuation reserves.
Investment rate of return*	7.0%
Payroll growth	Inflation of 2.75% per year plus "across the board" real salary increases of 0.50% per year.
COLA	CPI increase of 2.75% each year. Retiree COLA increases due to CPI are assumed to be 2.5% per year

Actuarial value of assets was $5.1 billion at 6/30/2022

**7.0%; net of investment expenses. Based on the change from 7.25% to 7.0% adopted by the Board in June 2023. The expected investment expenses represent about 0.40% of the Market Value of Assets*

Glossary

Active management – The process of constructing a portfolio with the goal of generating a return on investment that is greater than the general market would otherwise provide. Asset-liability studies exclude the potential gains/losses from active management.

Actuarial expected return – A pension fund portfolio's actuarial expected return is the rate used to discount future benefits to determine plan liabilities and is designed to be a reasonable expectation of the future rate of return on the pension plan's assets. Also known as the actuarial assumed rate and the discount rate.

Actuarial liability – The present value of benefits earned to date plus the present value of benefits that will result from future increases in salary and service already earned.

Asset allocation – Asset allocation is the process by which an investor aims to balance risk and reward according to the plan's goals, risk tolerance and investment horizon. Assets are allocated between asset classes that have different levels of risk and return and behave differently from one another to provide diversification.

Asset/liability analysis – A study that analyzes the future relationships between assets, liabilities, benefits and funding. A projection model previews how liabilities and required contributions react in various capital market environments, relying on assumptions regarding markets, plan membership, inflation, and various assumptions made by the plan's actuary.

Contributions – Employer and employee contributions into the system are determined by the plan's annual actuarial valuation and are updated regularly to ensure that contribution rates are sufficient to fund the plan. Actuarial valuations are based on the benefit formulas for the employee groups covered.

Glossary (cont'd)

Correlation – A measure of the relative movement of returns of one security or asset class relative to another over time. A correlation of 1 means the returns of two securities move in lock step, a correlation of -1 means the returns of two securities move in the exact opposite direction over time. Correlation is used as a measure to help optimize the benefits of diversification when constructing an investment portfolio.

Diversification – Diversification is a form of risk management whereby a variety of investments that are uncorrelated are combined in a portfolio with the goal of providing the highest return for a given level of risk. Diversification also mitigates unsystematic (company specific) risk.

Downside risk (drawdown risk) – A measure of volatility, or risk, focusing on downside or negative performance time periods. Drawdown risk is a subset of downside risk that measures peak to trough declines and is defined as the negative half of standard deviation.

Funded ratio (funded status) – A measurement of the funded status of the system. The funded ratio is calculated by dividing the valuation assets by the actuarial accrued liability. For example, a funded ratio of 90% indicates that assets are 10% less than liabilities.

Normal cost – Represents the portion of the cost of projected benefits allocated to the current plan year.

Peer risk – Peer risk refers to having a plan portfolio that looks different from the average pension plan. Peer risk is most often highlighted during periods of underperformance versus average plans.

Glossary (cont'd)

Standard deviation – A measure of volatility, or risk. Measures risk by indicating how far from the average, or mean, return one is likely to fall in any given time period. The rules of statistics dictate that you will fall within 1 standard deviation of the mean 2/3 of the time and within 2 standard deviations 95% of the time. For example, if a security has an average annual rate of return of 10% and a standard deviation of 5%, then two-thirds of the time, one would expect to receive an annual rate of return between 5% and 15%.

Volatility – A statistical measure of the dispersion of returns for a security, index or portfolio. Generally speaking, the higher the volatility, the riskier the investment. Volatility is most commonly measured using standard deviation (defined above).

Notices & disclosures

Past performance is no guarantee of future results. *This document is provided for informational purposes only and is directed to institutional clients and eligible institutional counterparties only and is not intended for retail investors. Nothing herein constitutes investment, legal, accounting or tax advice, or a recommendation to buy, sell or hold a security or pursue a particular investment vehicle or any trading strategy. This document may include or imply estimates, outlooks, projections and other "forward-looking statements." No assurance can be given that future results described or implied by any forward looking information will be achieved. Investing entails risks, including possible loss of principal. Additional information about Verus Advisory, Inc. is available on the SEC's website at www.adviserinfo.sec.gov.*

Verus – also known as Verus Advisory™.

ALTERNATIVE INVESTMENTS RECORDS

EXEMPT FROM PUBLIC DISCLOSURE

(CA Gov. Code §7928.710)
(CA Gov. Code §7922.000)
(CA Gov. Code §54957.5)

DO NOT REPRODUCE

DO NOT DISTRIBUTE

ALTERNATIVE INVESTMENTS RECORDS

EXEMPT FROM PUBLIC DISCLOSURE

(CA Gov. Code §7928.710)
(CA Gov. Code §7922.000)
(CA Gov. Code §54957.5)

DO NOT REPRODUCE

DO NOT DISTRIBUTE

ALTERNATIVE INVESTMENTS RECORDS

EXEMPT FROM PUBLIC DISCLOSURE

(CA Gov. Code §7928.710)
(CA Gov. Code §7922.000)
(CA Gov. Code §54957.5)

DO NOT REPRODUCE

DO NOT DISTRIBUTE